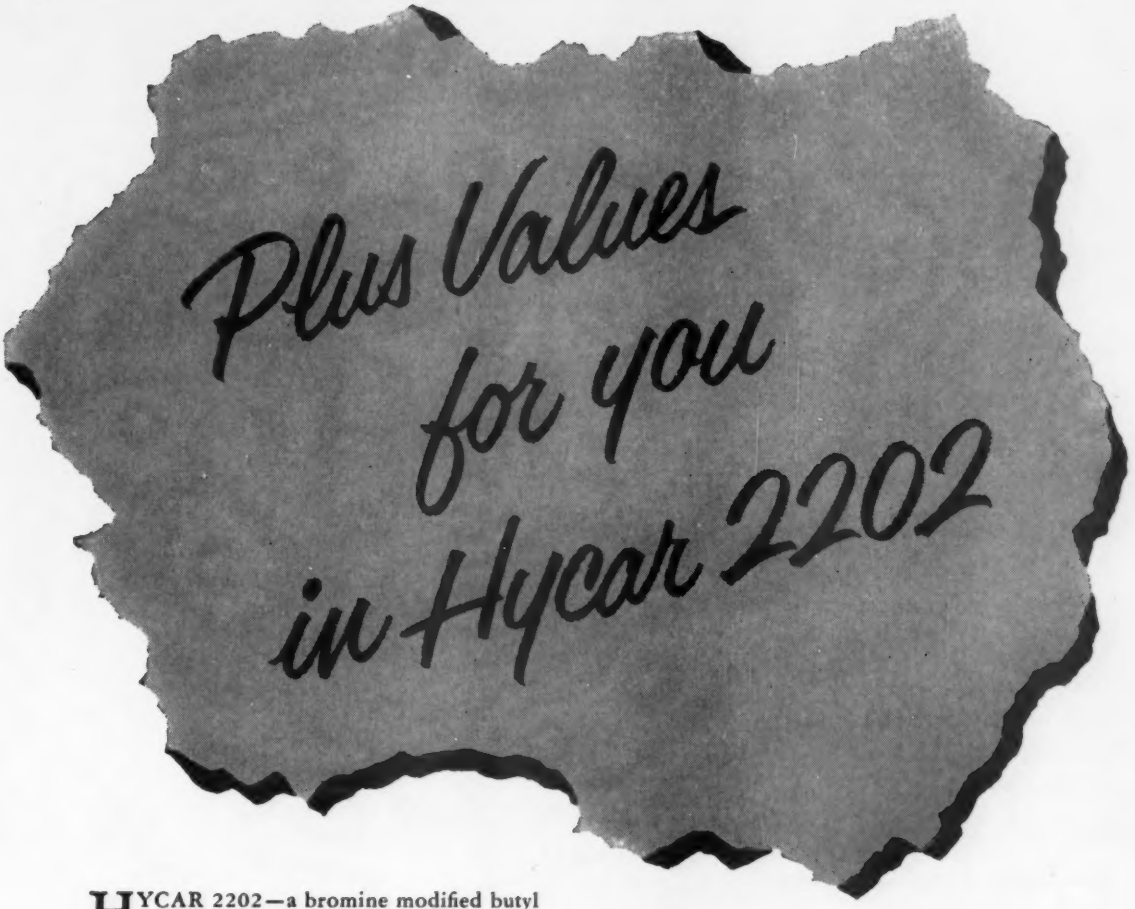
News about

B. F. Goodrich Chemical *raw materials*



HYCAR 2202—a bromine modified butyl rubber—offers outstanding properties unobtainable with conventional butyl, yet retains the typical butyl properties of excellent ozone resistance, heat and light aging resistance, electrical resistance, and exceptionally low air permeability.

Check these plus values . . . they may add up to important new applications; perhaps show you how to improve an operation or make a superior product.

CURES FASTER, MORE CONSISTENTLY . . . good, consistent cures obtainable using only approximately one-half as much accelerator.

EXCELLENT COMPATIBILITY . . . can be blended and cured with crude, GR-S, butyl, and other rubbers.

SUPERIOR BONDING . . . adheres strongly to butyl, other rubbers, and metals.

WIDE RANGE OF APPLICATIONS . . . cement and adhesives, wire and cable, tire curing bags and bladders, inner tubes, coated fabrics, belts, hose and tubing, and mechanical goods.

Hycar 2202, originally introduced as Hycar HH, is now readily available in commercial quantities. For complete technical information, please write Dept. CJ-3, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

B. F. Goodrich Chemical Company
A Division of The B. F. Goodrich Company

Hycar
Reg. U.S. Pat. Off.
American Rubber

GEON polyvinyl materials • HYCAR American rubber and latex • GOOD-RITE chemicals and plasticizers • HARMON colors

Rubber Products Look Better . . . Feel Better . . . when made with PHILBLACK* A!

How can you put glamour in galoshes . . . beauty in boots? Well, Philblack A is actually a beauty treatment for rubber . . . gives it a smooth satiny finish and pleasing "rubbery" feel. And we don't need to tell you that more sales-appeal means more profits for the manufacturer!

Phillips extensive research on the subject of rubber and carbon blacks, covering a period of twenty years, has developed four distinctive carbon blacks with important individual qualities and characteristics that make each Philblack tops in its own field.

Our technical staff will gladly advise you on your specific carbon black requirements. Write for full information concerning the Philblacks.

*A TRADEMARK

Know the Philblacks!

KNOW WHAT THEY'LL DO FOR YOU!

A — **Philblack A FEF Fast Extrusion Furnace Black**
Ideal for smooth tubing, accurate molding, satiny finish. Mixes easily. High, hot tensile. Disperses heat. Non-staining.

I — **Philblack I ISAF Intermediate Super Abrasion Furnace Black**
Superior abrasion resistance at moderate cost. Very high resistance to cuts and cracks. More tread miles at high speeds.

O — **Philblack O HAF High Abrasion Furnace Black**
For long, durable life. Good electrical conductivity. Excellent flex. Fine dispersion.

E — **Philblack E SAF Super Abrasion Furnace Black**
Toughest black on the market. Extreme abrasion resistance. Withstands aging, cracking, cutting and chipping.

Phillips 66

PHILLIPS CHEMICAL COMPANY, Philblack Sales, 318 Water Street, Akron 8, Ohio. Export Sales: 80 Broadway, New York 5, N. Y. West Coast: Harwick Standard Chemical Company, Los Angeles, California. Canada: H. L. Blachford, Ltd., Montreal and Toronto.

the simple answer to compound problems

If your problems are the breaking down, mixing or blending of rubber, plastics and similar substances, then the best and simplest answer is the Intermix. The Intermix, designed and built by Francis Shaw, the pioneers of rubber and plastics machinery, is the most versatile heavy-duty Internal Mixer available today. Natural and synthetic rubbers, ebonite, etc., are compounded at lower temperatures than are usually associated with other internal mixers, but, in addition, this enclosed machine can be steam heated for blending plastics, and other materials. Efficient in operation, compact in design, and incorporates a unit gearbox allowing the use of two-speed motors and providing a compact rigid and vibration-free assembly.

SHAW

INTERMIX

Industry's headquarters for the best in Rubber and Plastics Machinery

FRANCIS SHAW AND COMPANY LIMITED MANCHESTER 11 ENGLAND

Enquiries to —

FRANCIS SHAW (CANADA) LTD GRAHAM'S LANE BURLINGTON ONTARIO CANADA

TELEPHONE NELSON 4-2350 TELEGRAMS CALENDER BURLINGTON ONTARIO

TAPES ARE TOPS

with release coatings containing CHEMIGUM

Good release from itself, or "cleanup," is essential to proper performance of pressure-sensitive paper tape. Good cleanup depends upon a smooth, stable release coating which has greater adhesion to the base paper than to the sensitized adhesive. A leading manufacturer finds a vinyl/CHEMIGUM coating gives him just that —a tape which unrolls for printing at 60 to 100 yards per minute, without sticking.

CHEMIGUM is the easy-processing nitrile rubber—first and finest in the field. It is fully compatible with the vinyl resin and serves as a nonmigrating plasticizer. In addition to permanence, CHEMIGUM imparts excellent adhesion to the nitrile rubber-impregnated paper and provides a surface highly receptive to printing or writing.

In preparation of the solution, this grade of CHEMIGUM breaks down rapidly under mastication and serves as an excellent grinding medium for the pigment. It also exhibits good solubility characteristics – quickly gives solutions which age well and do not form irreversible gels.

This same manufacturer also uses CHEMIGUM LATEX in a tie-coat to bind the natural rubber-based adhesive to the paper, and PLIOLITE S-5 – a high styrene-butadiene copolymer—in the adhesive itself. The CHEMIGUM LATEX is fully compatible with certain resins to give excellent adhesion and the smoothest film of all the latices tried. The PLIOLITE S-5 greatly improves the film strength of the adhesive and increases its resistance to oxidation.

Details, samples and technical help on CHEMIGUM and related latices, resins or rubbers—from the "greatest name in rubber"—are yours by writing:

Goodyear, Chemical Division, Akron 16, Ohio

CHEMICAL GOODYEAR DIVISION

Chemigum, Pliobond, Pliolite, Plio-Tuf, Pliovic—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

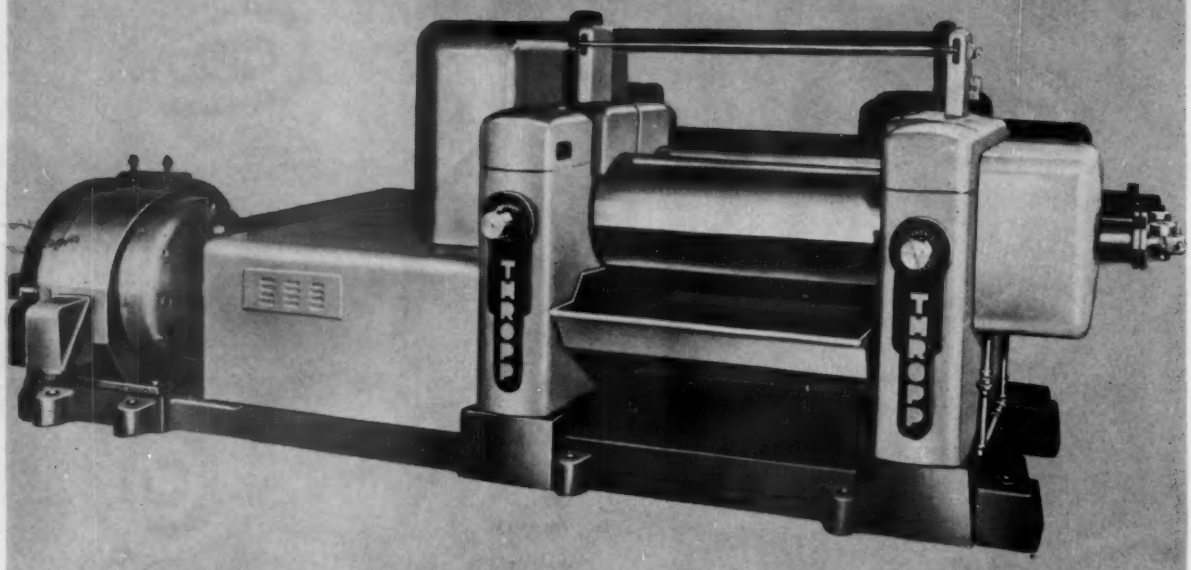
The Finest Chemicals for Industry — CHEMIGUM · PLIOBOND · PLIOLITE · PLIO-TUF · PLIOVIC · WING-CHEMICALS

CHEMIGUM... another quality product of Goodyear Chemical Division

Photo courtesy Coated Products, Inc., Bound Brook, N. J.

The THROPP 60" MILL

earns the confidence of management



Thropp 22" x 22" x 60" Mill

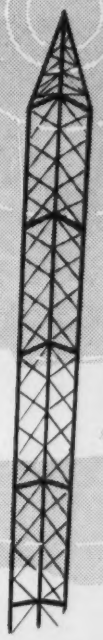
This clean, streamlined Mill is a real workhorse, designed and built in every detail for dependable, uninterrupted production in the Rubber and Plastics Industries.

send for complete information

Wm. R. THROPP & Sons

Division of J. M. LEHMANN COMPANY, Inc.

555 NEW YORK AVE., LYNDHURST, N. J.



"ON THE BEAM" ADHESION

For Bonding RUBBER - TO - METAL in Electronic Equipment

TY-PLY®

NEW UP - RC

BOND IS UNAFFECTED BY EXPOSURE TO OZONE

TY-PLY "UP" . . . the new Universal Primer and TY-PLY "RC" . . . the improved Rubber Cover Cement are exceptionally suitable for natural rubber stocks (both normal and low-sulfur), standard and cold-polymerized GR-S's, polybutadiene, oil-modified GR-S, arctic-type GR-S and natural-GR-S biends. Both adhesives have excellent shelf and working stability; are insensitive to weather or ozone conditions; and work well over a wide range of curing temperatures.

TY-PLY "Q" or "3640"
for bonding Natural, GR-S, and Butyl

TY-PLY "BN"
for bonding N-types

TY-PLY "S"
for bonding Neoprene

TY-PLY will adhere most vulcanizable rubber compounds to almost any clean metal surface

Marbon

MARBON CHEMICAL
Division of BORG-WARNER
GARY, INDIANA

TY-PLY has stood the test of time . . . since '39

ZnO is *definitely* in the picture

In putting rubber to work, scientists have succeeded in imparting to this versatile material a great variety of properties. The desirable characteristics in each case depending upon the product's eventual use. In the application illustrated here, *resistance to wear* is, obviously, the prime consideration. Now look at the rubber tip on an ordinary pencil and consider that an eraser does its job by *wearing away*. Could anyone ask for a better example of versatility?

Zinc Oxide is a basic ingredient in nearly all products made from either natural or synthetic rubber compounds. ST. JOE lead-free ZINC OXIDES are produced by a unique electrothermic method – a modification of the direct-from-ore, or American Process. Zinc Oxides thus produced combine most of the desirable properties of the American and French Process types.

ST. JOE ZINC OXIDES are available in grades to fit most any need, and their uniform high quality accounts for their wide use by the country's leading producers of rubber products.

Photo above: Tire for off-the-road service must resist cuts, snaps, tears and severest rock penetration.

Below: Tractor pulling log arch drags 5-ton logs to truck loading points.

ST. JOSEPH LEAD CO.

250 PARK AVE., NEW YORK 17 ***Plant & Laboratory, Monaca (Josephtown) Pa.***

YOU CAN GET

CLOSER GAUGE CONTROL

with the F-B® "Tri-angular" calender

The right-angle roll arrangement of the Farrel-Birmingham Tri-angular calender assures closer control of gauge in any type of production requiring two passes. With only two rolls in any plane, there is no pressure from a third roll to affect roll settings and cause fluctuations in gauge. Hydraulic pullback cylinders hold the rolls in position, eliminating backlash in boxes and adjusting screws.

The angle of the rolls makes feeding easier. No feed table is necessary because the lower roll supports the feed bank. Both the bank and the guides are easily accessible from the floor level.

Where even closer control of gauge is desired a motorized crossed-axes device for regulation of roll crown is available. Other optional features include rolls drilled longitudinally for close temperature control, and the Farrel Uni-drive.

The Tri-angular calender is available in a choice of sizes. Write for further information.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONN.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston FB-966

Farrel-Birmingham®

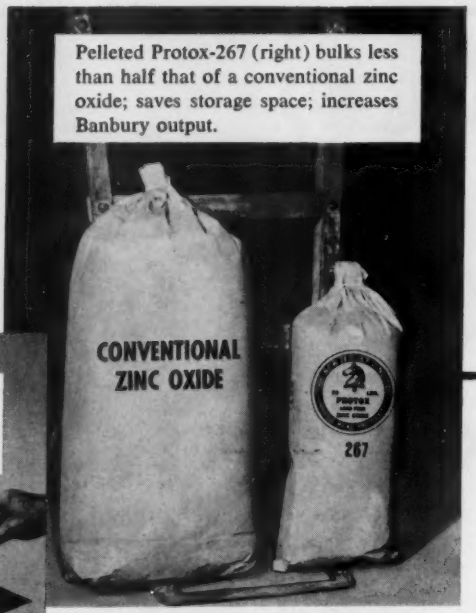
It's NEW! PROTOX-267 PELLETED ZINC OXIDE

Cuts Handling, Storage, Mixing and Processing Costs

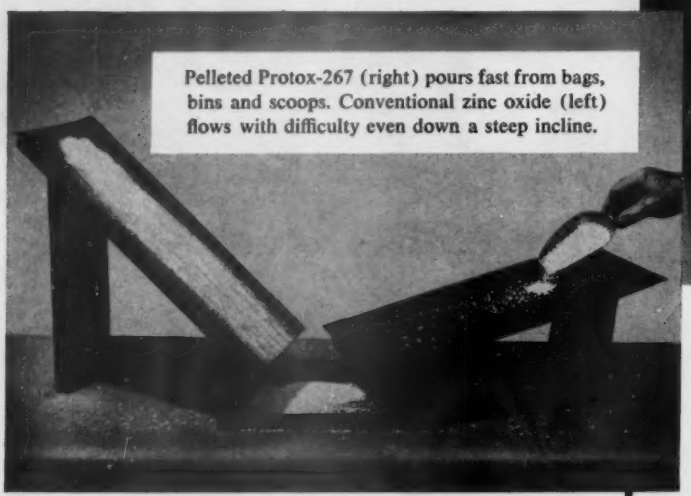
Protox-267* zinc oxide brings you the many unique advantages of both propionic acid treatment and pelleting.

Its base is Protox-166, well recognized for its fast mixing, excellent dispersion and good processing properties.

It retains all the features of Protox-166 and adds to them the important advantages of pellets.



Pelleted Protox-267 (right) bulks less than half that of a conventional zinc oxide; saves storage space; increases Banbury output.



Pelleted Protox-267 (right) pours fast from bags, bins and scoops. Conventional zinc oxide (left) flows with difficulty even down a steep incline.

- ★ *Faster, easier handling*
- ★ *Quicker weighing*
- ★ *Less dusting loss*
- ★ *Smaller storage space*
- ★ *Greater Banbury output*

Our representatives will be glad to discuss how you can cut your costs with Protox-267.

*U. S. Patents 2,303,329 and 2,303,330

THE NEW JERSEY ZINC COMPANY

Producers of Horse Head Zinc Pigments

. . . most used by rubber manufacturers since 1852

160 Front Street, New York 38, N. Y.

HORSE HEAD PRODUCTS

save money increase quality

in your RUBBER COMPOUNDING with

CALCENE TM®

Calcene TM enables savings to be made on delivered volume cost when compared with various other widely used pigments.

The ease and feasibility of using Calcene TM to replace costlier pigments—either fully or partially—warrants your prompt investigation, especially now when production economies are becoming an increasingly important factor in your business.

CALCENE TM is a specially prepared, white, coated precipitated calcium carbonate of fine particle size.

HI-SIL®

Hi-Sil is another exclusive Columbia-Southern® rubber reinforcing pigment. Hi-Sil has been used extensively in the production of non-black natural, GR-S, butyl and Neoprene compounds where an extremely high level of physical properties is required.

Improved performance in compounding and high quality result when Hi-Sil is used.

HI-SIL is a precipitated silica with a specific gravity of 1.95 and an average particle size of .025 micron. Hi-Sil imparts high modulus, high tensile and tear, and extremely high abrasion resistance.

SILENE EF®

Are you looking for a white reinforcing pigment that will give you excellent physical properties? Then give first consideration to Silene EF.

Not only will you be sure of high quality in white or colored natural rubber compounds, but also in GR-S stocks.

And yet this extra quality costs you nothing more, for Silene EF is equivalent in volume cost to ordinary reinforcing pigments.

SILENE EF is a very finely divided, white, precipitated, calcium silicate.

You are invited to write for further information, free technical bulletins, or experimental working samples.

COLUMBIA-SOUTHERN CHEMICAL CORPORATION

SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY

ONE GATEWAY CENTER · PITTSBURGH 22 · PENNSYLVANIA

DISTRICT OFFICES: Cincinnati • Charlotte Chicago • Cleveland • Boston • New York St. Louis • Minneapolis • New Orleans Dallas • Houston • Pittsburgh • Philadelphia San Francisco

IN CANADA: Standard Chemical Limited and its Commercial Chemicals Division

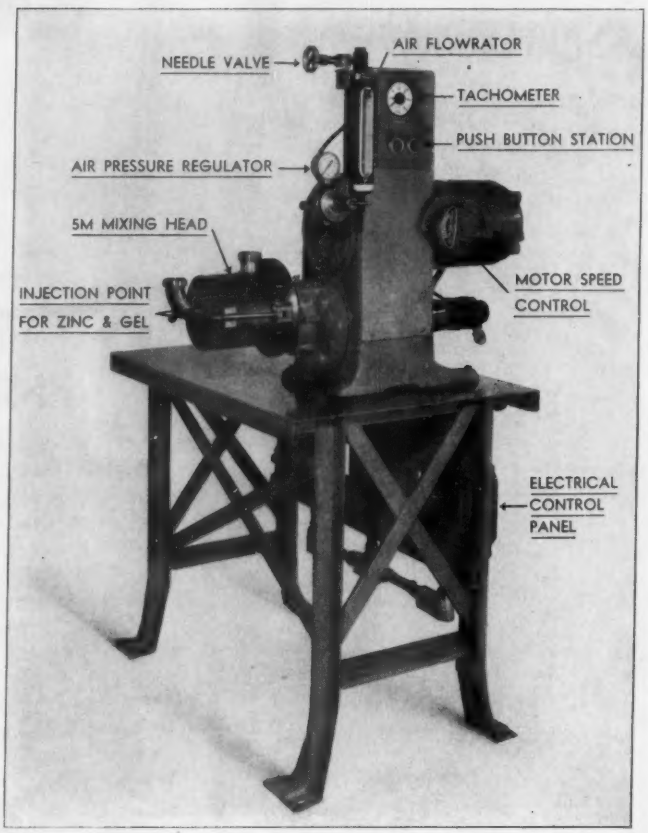
NEW OAKES BLENDER CUTS DOWN MIXER SHUTDOWNS!

Your present big production of foam rubber from your Oakes Continuous Automatic mixers can be increased even more by adding the new Oakes blender. With the blender there is no clogging of the foaming head; hence shutdowns for cleaning are eliminated; continuous, uninterrupted production can be maintained. Runs for hour after hour, around the clock, are possible, with production at 2,000 pounds and more per hour.

Clogging or coagulation of latex in the foaming-head is eliminated because the coagulating agents—zinc and gel—are not added until the partially foamed latex passes out of the foaming head into the blender head. In the blender head the zinc oxide slurry is introduced into the stream through a needle; the gel is similarly atomized into it by means of an air jet. This insures even distribution throughout the foamed latex, and finishes off and completes the foaming.

The stainless steel blender head, into which the foamed latex is piped from the foaming head, is small—just five inches in diameter and six inches long, electro-polished to mirror smoothness with no pockets or dead ends, permitting a clean, swift sweep-through without clogging. Even extremely unstable formulations can be used; if, in such cases there should be a build-up, the blender head can be opened and exposed instantly by loosening two thumb screws; a quick spurt from a water hose cleans it. The entire blender unit weighs but 150 pounds and occupies a space only 24" x 36". Speed of the blender is variable—50 to 1050 rpm's.

By attaching the new Oakes blender to your



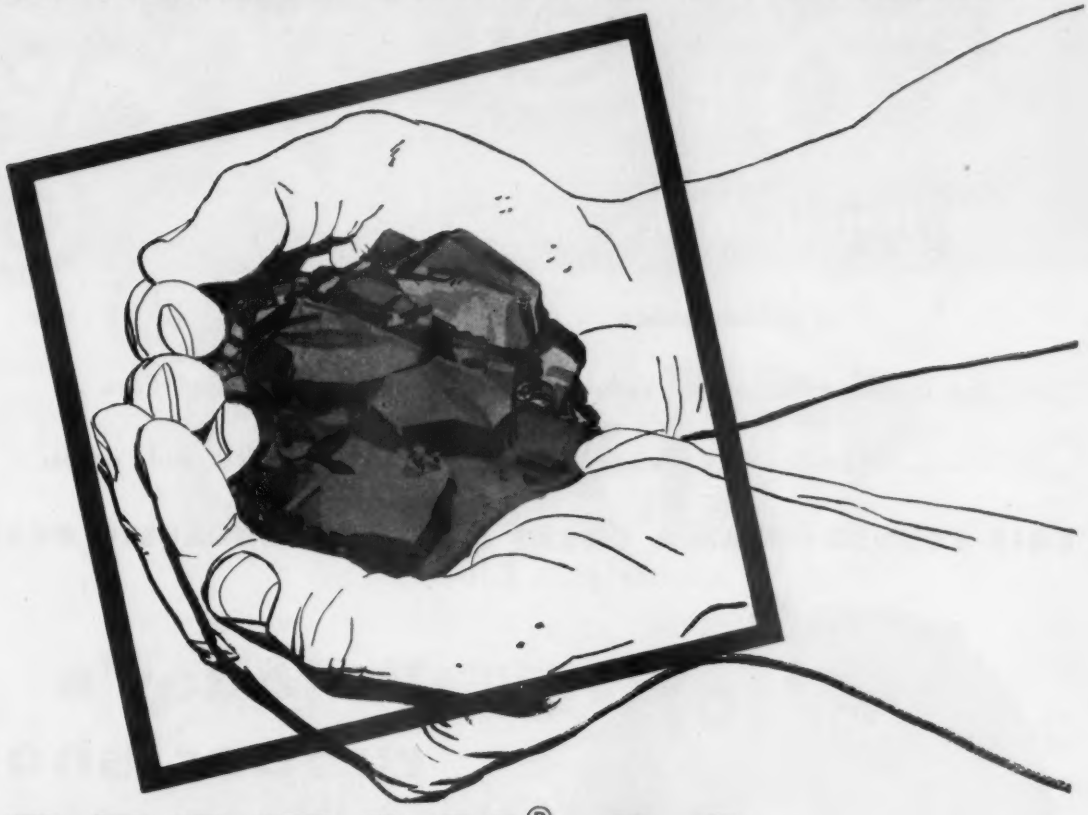
Oakes mixer no time is lost for cleaning the foaming head; your equipment can operate at all times at top capacity, with attendant increases in output. The blender can add substantially to the gains you already have enjoyed through your original Oakes mixer installation.

THE E. T. OAKES CORPORATION

DEPARTMENT BL3 • COMMACK ROAD, ISLIP, L. I., NEW YORK

Export Representative: VANDERBILT EXPORT CORP., 230 Park Avenue, New York, N. Y.

Avoid crumbled batches in GR-S stocks...



USE PEPTON® 22

Plasticizer

—reduces Mooney values...improves processing

PEPTON 22 Plasticizer prevents crumbling of oil-extended GR-S batches when they are dumped from the Banbury onto the sheet-off mill. PEPTON 22 effects a marked reduction in Mooney Viscosity values and insures proper consistency for better processing.

CUT POWER CONSUMPTION... REDUCE YOUR BREAKDOWN TIME WITH PEPTON 22 PLASTICIZER

Ideal for use in natural rubber or GR-S stocks.

Calco®

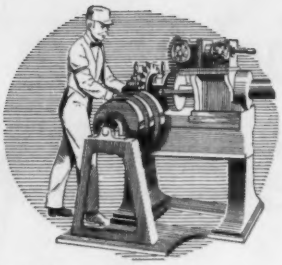
AMERICAN Cyanamid COMPANY

INTERMEDIATE & RUBBER CHEMICALS DEPARTMENT

BOUND BROOK, NEW JERSEY

SALES REPRESENTATIVES AND WAREHOUSE STOCKS: Akron Chemical Company, Akron, Ohio • H. M. Royal, Inc., Trenton, N. J. • H. M. Royal, Inc., Los Angeles, Calif. • Ernest Jacoby and Company, Boston, Mass. • Herron & Meyer of Chicago, Chicago, Ill. • In Canada: St. Lawrence Chemical Company, Ltd., Montreal and Toronto

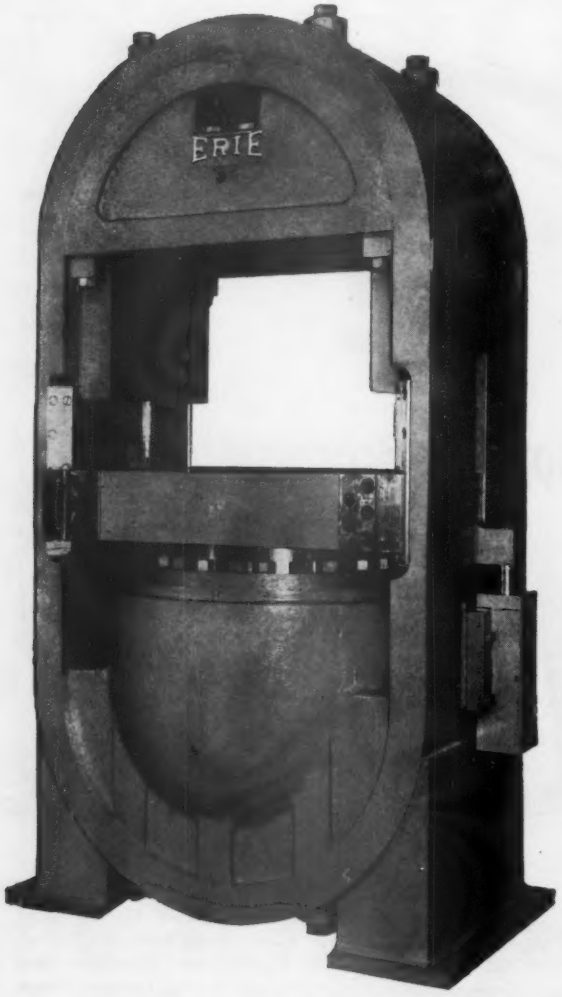
In the good old days



WHEN GRANDPA RAN THIS EXTRUDER

WHEN Germany was the world's largest exporter of rubber goods . . . when South America was the largest exporter of crude rubber which was then called Para . . . . . when the first Malaya plantation yielded crude rubber

ERIE FOUNDRY WAS A GREAT NAME IN HYDRAULIC PRESSES



in today's rubber shop

...when low stress insures minimum deflection

...when high pressures evenly applied to practically deflection-free (within .002 inches) platens guarantee thin flash lines

...when competitive bidding demands maximum service for minimum cost

ERIE

is by far the greatest name in special precision hydraulic presses

IN OUR 60TH YEAR **ERIE FOUNDRY CO. ERIE, PA.**

A new use for Cabflex® DDP...
tested and proved
superior at lower formulation costs...

Courtesy of The Rex Corporation, West Acton, Mass.

Cabflex® DDP

CABOT'S *di-decyl phthalate*

for HIGH TEMPERATURE WIRE VINYL INSULATION

- **Cabflex® Di-OP**
  di-iso-octyl phthalate
  standard primary plasticizer
- **Cabflex® DOP**
  di-2-ethylhexyl phthalate
  standard primary plasticizer
- **Cabflex® ODP**
  iso-octyl decyl phthalate
  improved flexibility permanence in vinyl compounds
- **Cabflex® DDP**
  di-decyl phthalate
  high molecular weight diester imparting remarkably low volatility
- **Cabflex Di-OA®**
  di-iso-octyl adipate
  standard low temperature plasticizer
- **Cabflex® DOA**
  di-2-ethylhexyl adipate
  standard low temperature plasticizer
- **Cabflex® ODA**
  iso-octyl decyl adipate
  improved low temperature permanence in vinyl compounds
- **Cabflex® DDA**
  di-decyl adipate
  low temperature diester with low volatility and high efficiency
- **Cabflex® Di-OZ**
  di-iso-octyl azelate
  low volatility, good water immersion properties impart excellent low temperature permanence
- **Cabflex Di-BA®**
  di-iso-butyl adipate
  nontoxic, approved for use in vinyl food wrappings by Food & Drug Administration
- **Cabol 100**
  hydrocarbon oil plasticizer
  low cost plasticizer, with plasticizer efficiency of 1.5; up to 50% compatibility with octyl-phthalate type plasticizers

CABOT COMPOUND A-957*	PARTS
Vinyl Resin (electrical grade)	100
CABFLEX® DDP	38
TCP	20
#33 Clay	5
Dythal	6
Paraffin	0.5

	CABOT A-957*	CONTROL* (ALL TCP)
Insulation Resistance — Megohms — 1,000 Ft.		
@ 15.4° C.	2530.00	3070.00
@ 60.0° C.	7.80	0.23
@ 75.0° C.	1.66	0.525
@ 50.0° C.		
1 day	17.9	1.97
1 week	26.0	0.80
3 weeks	69.0	1.20
9 weeks	31.0	0.71
Low Temperature Properties**		
Passed	−20° F.	−10° F.
Failed	−30° F.	−20° F.
Retention of Elongation		
7 days at 113° C.	89%	83%
Pound Volume Cost***	44.7¢	48.0¢

All Tests Run On #18 Wire, 1/32" Wall Thickness

* *Commercially available 80° C. wire compound*
** *Bent around 0.118" mandrel*
*** *Based on current list prices of raw materials*

For samples and for further technical information address

CABOT PLASTICS CHEMICALS DIVISION

GODFREY L. CABOT, INC. 77 Franklin St., Boston 10, Mass.

4

CALCIUM CARBONATE *extender pigments*

developed for your specialized needs

GamaCo

CALWHITE

5-25

No. 10

PRODUCED FOR YOU from pure crystalline marble under rigid quality controls. Why not test their excellent properties in your own laboratory? We'll be glad to send you samples and technical information without obligation. Just write

C P D — the Georgia Marble Company

CALCIUM PRODUCTS DIVISION

THE GEORGIA MARBLE COMPANY • TATE, GEORGIA

REPRESENTATIVES:

ANDERSON & COMPANY
547 Aqueduct St.
Akron, Ohio

COMMERCIAL CHEMICALS, LTD.
Div. of Standard Chemical Co., Ltd.
Pier H, Carrall St., Vancouver, B.C.

HAROLD T. ILLING COMPANY
4200 W. Monarch Place
Milwaukee, Wisconsin

PACIFIC COAST CHEMICALS CO.
2060 Third St.
Berkeley, California

FRANK E. DEMPSEY & CO., LTD.
Toronto and Montreal
Canada

JOHN K. BICE COMPANY
440 Seaton St.
Los Angeles, California

GRIFFITH-MEHAFFEY CO., INC.
102 Poydras St.
New Orleans, Louisiana

E. B. McCULLOUGH COMPANY
2301 Commerce Street
Houston, Texas

W. W. RICHERSON COMPANY
712 Unit 2, Santa Fe Building
Dallas, Texas

WYROUGH & LOSER
801 Broad St. Bank Building
Trenton, New Jersey

GEORGE C. BRANDT, INC.
760 Vandalia St.
St. Paul 4, Minnesota

THE C. P. HALL CO. OF ILLINOIS
5145 West 67th St.
Chicago, Illinois

THE L. A. MILLER COMPANY
Republic Building
Louisville, Kentucky

G. S. ROBINS COMPANY
126 Chateau Avenue
St. Louis 2, Missouri

W. RONALD BENSON, INC.
820 First Avenue, South
Seattle 4, Washington

CHAPMAN CHEMICAL COMPANY
707 Cermon Building
Memphis, Tennessee

R. T. HOPKINS & COMPANY
544 Means Street, N. W.
Atlanta, Georgia

MORTON-MYERS COMPANY
27 Southwest Blvd.
Kansas City, Kansas

SMITH CHEMICAL & COLOR CO.
55 John St.
Brooklyn, New York

WALL-WESTERN, INC.
2133 N. W. York
Portland 10, Oregon

88 MIRACLE MILES

The recently opened West Virginia Turnpike is a tribute to man's engineering skill, his desire for constant improvement in transportation and a tribute to the State which had the vision and courage to plan and build the $133,000,000 project.

This Turnpike, which traverses the area between Charleston and Princeton (near the Virginia border), makes the journey 22 miles shorter and saves approximately two hours in travel time. It opens one of the most beautiful scenic areas in the East. To all who ride over it, the West Virginia Turnpike represents 88 miracle miles.

Thus, man progresses in his ability to transport himself and his products. The rubber tire is the base on which this ability rests. The strength, durability, long life and dependability of the rubber tire began when compounders first began to use carbon black as an additive.

This Company, past whose home offices people pass in reaching or leaving the West Virginia Turnpike, has long been a leader in the production of carbon blacks — carbon blacks of quality, which have been the choice of those who prefer the best.

UNITED CARBON COMPANY, INC.

Use UNITED CARBON BLACKS

United's channel blacks pioneered the reinforcement of rubber. To date Kosmobile HM (MPC) and Kosmobile 77 (EPC) are still the undisputed leaders for safe processing and for imparting high tensile strengths and elongations to all types of rubbers.

Kosmobile blacks are most dependable for uniform quality and satisfactory performance. Obviously, compounders rely upon them for solving cost and quality problems.

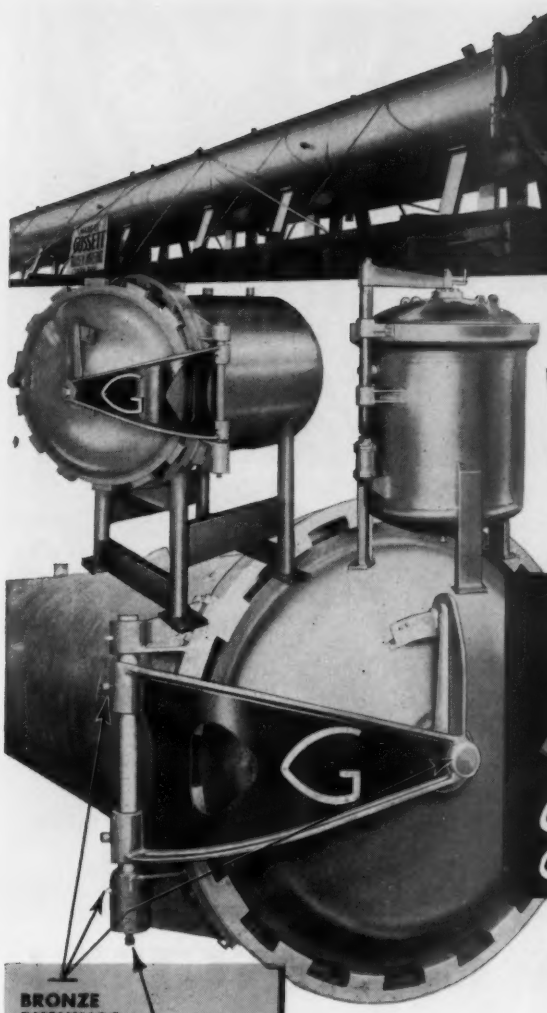
United blacks are backed by a wealth of manufacturing experience and world-wide use. The trend is towards better blacks. Naturally, this means United Blacks.

Specify UNITED BLACKS

UNITED CARBON COMPANY, INC.

CHARLESTON 27, WEST VIRGINIA

NEW YORK AKRON CHICAGO BOSTON MEMPHIS



GUSSETT

VULCANIZERS

WITH

GUSSETT EASY GLIDE QUICK OPENING DOORS

Cost Less to Own ...Less to Operate

Safe, Fast, Easy Door Operation

Note use of heavy lubricated bronze bushings at all wearing points and thrust bearing to support weight of door.

The Gussett Easy-Glide Quick-Opening Door is the result of almost forty years of practical experience in designing and building processing equipment for the rubber industry.

Fabricated of heavy steel plate, it offers high strength and a higher factor of safety without excessive weight. Precision machining insures accurate seating and freedom from leakage.

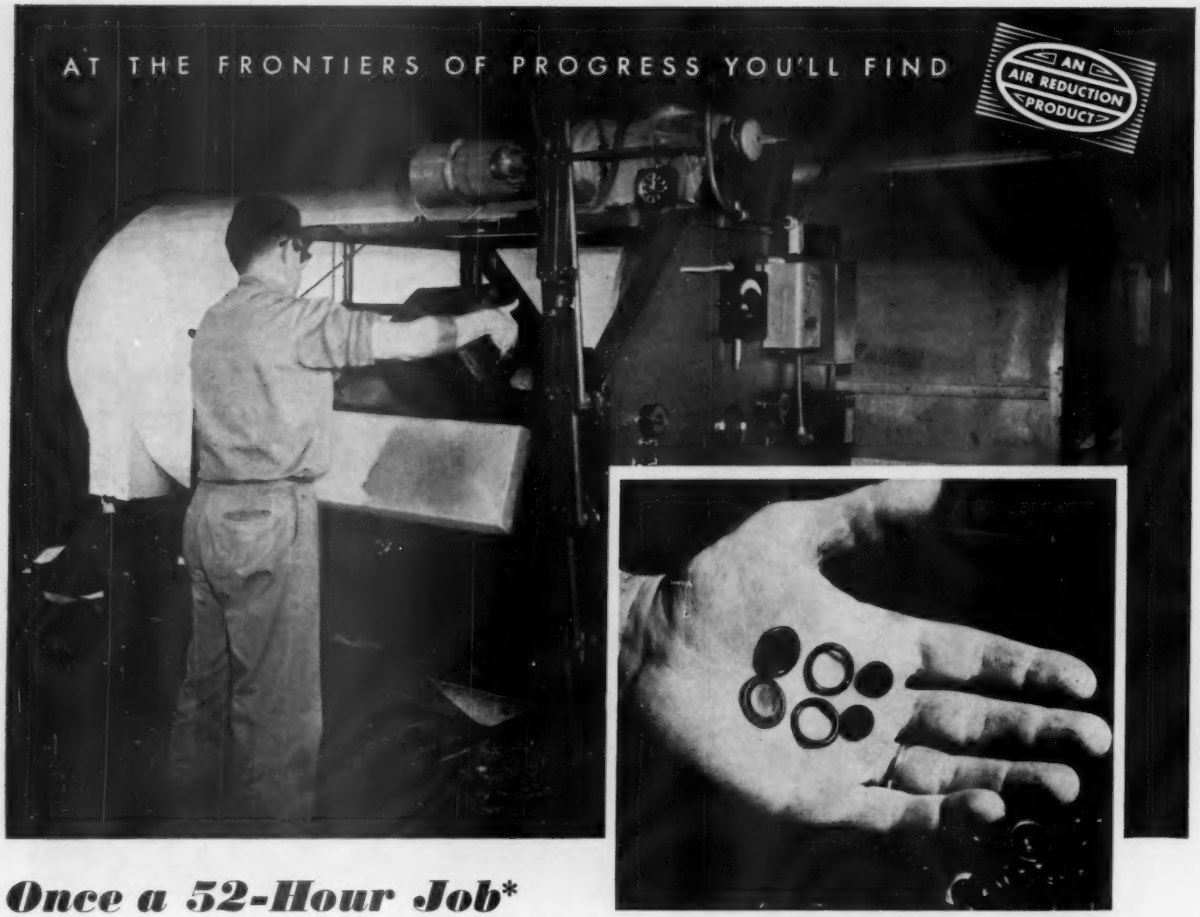
The large-diameter hinge pin and door center pin turn in heavy, pressure-lubricated bronze bushings and the weight of the door is supported by heavy-duty roller thrust bearings to minimize time and effort required to open and close the door and insure long, trouble-free service. Hundreds of Gussett Easy-Glide doors are in use all over the world.

Easy-Glide Doors are furnished without extra cost (often at important savings) on all Gussett-built Vulcanizers . . . horizontal or vertical . . . 18 inches and larger . . . any desired length . . . for any working pressure up to 600 pounds.

WRITE OR WIRE FOR BULLETIN

GUSSETT BOILER & WELDING, INC.

1545 Whipple Road S. W. • Canton 10, Ohio



*Once a 52-Hour Job**

NOW IT'S DONE IN 20 MINUTES!

*It used to take as much as 52 hours to deflash the small rubber valve discs shown. The same job done better by tumbling with Pureco liquid CO_2 takes only 20 minutes for flash-free results.

Here is a process that means greater profits for you . . . much lower labor costs . . . fewer rejects . . . gentler handling of delicate parts . . . and greater adaptability.

While rubber tumbling may not be new to you, the Pureco man may be able to help you improve your techniques, enable you to tumble a far greater variety of parts. Ask him to call. He'll be glad to take your "problem" parts to our laboratory experts for a full confidential report on the method of tumbling that is best for you—and, of course, at no obligation.

PURECO

Pure Carbonic Company

NATION-WIDE "DRY-ICE" SERVICE-DISTRIBUTING STATIONS IN PRINCIPAL CITIES

GENERAL OFFICES: 60 EAST 42ND STREET, NEW YORK 17, NEW YORK

PURE CARBONIC COMPANY *is a division of* **AIR REDUCTION COMPANY, INCORPORATED** *Principal products of other divisions include:* **AIRCO** *— industrial gases, welding and cutting equipment and acetylenic chemicals* **OHIO** *— medical gases and hospital equipment* **NATIONAL CARBIDE** *— pipeline acetylene and calcium carbide* **COLTON CHEMICAL COMPANY** *— polyvinyl acetates, alcohols and other synthetic resins.*

Pyratex

a new cord treatment for new tire toughness!

Naugatuck – developer of the first natural latex for tire cord treatment, then the first reclaim dispersion, and later GR-S plus Resorcinal – now offers you a special vinyl pyridine latex that increases rubber-to-fabric adhesion up to 50%!

New Pyratex

- binds rayon to rubber with a grip almost as strong as the cord itself.
- retains its outstanding adhesion even under the severe heat and flexing of high-speed tire travel.

What's more, this superior solutioning agent . . .

- develops adhesion more rapidly with cure.
- greatly reduces "curing blows."
- is supplied at higher solids with resulting conveniences.

You'll find Pyratex will raise the performance of reinforced rubber in airplane, truck, bus, and automobile tires, in V-belts and conveyor belts—*wherever* fatigue resistance and ply separation pose problems.

New Pyratex is available for your own further compounding, or as a **Lotol, custom-compounded and ready to use—with good storage stability.** To find out more about how it can help your product—economically—write on your letterhead to the address below.

Naugatuck Chemical

Division of United States Rubber Company

Naugatuck, Connecticut

BRANCHES: Akron • Boston • Charlotte • Chicago • Los Angeles • Memphis • New York • Philadelphia • IN CANADA: Naugatuck Chemicals, Elmira, Ontario
Rubber Chemicals • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latices • Cable Address: Rubexport, N. Y.

Fabric helps boost coal —to power

Enclosed Hewitt-Robins conveyor belt at Duke Power Company's Lee Steam Station, Pelzer, S. C.

Problem: Boosting a half million tons of coal yearly 365 feet from ground level to bunkers 82 feet high at the Lee Steam Station of Duke Power.

A 36-inch wide conveyor belt was—and is—the answer. Because of the load and inclination, unusual tension develops in the belt. By using a specially constructed Wellington Sears "Shawmut" belt duck, Hewitt-Robins' engineers designed a 763-foot belt that withstands the tension successfully, performs with outstanding efficiency.

This belting has to be extraordinarily strong and durable. It is—carrying up to 500 tons of coal an hour, 425 feet a minute. Indeed, since stoppage would shut the Station down within a matter of hours, the belt is guaranteed by the manufacturer not to stretch excessively and thereby require re-splicing. It has not. Since installation in 1950, it has run seven days a week without being stopped for repairs.

This belting also conveys a basic idea. Wellington Sears has blue-printed fabrics for industrial progress for over a century. Whatever your fabric need, cotton or synthetic—for coating or impregnation—unparalleled experience and equipment are at your service. Write us for illustrated booklet, "Modern Textiles for Industry."

Wellington Sears

A Subsidiary of West Point Manufacturing Company

FIRST In Fabrics For Industry

For Mechanical Goods, Coated Materials, Tires, Footwear and Other Rubber Products

Wellington Sears Co., 65 Worth St., New York 13, N. Y. • Atlanta • Boston • Chicago • Dallas • Detroit • Los Angeles • Philadelphia • San Francisco • St. Louis

Compressing 200,000 square feet into 60

You're looking at a giant titanium plant in miniature—as set up in the Glidden Laboratories in Baltimore. It is a small-scale "plant" that transforms jet black titanium ore into gleaming white pigment. This hydrolysis process provides an accurate check on every shipment of titanium ore received by Glidden.

It's all part of the vigilant Glidden quality control program—established to assure you the finest in pigments of all types—ZOPAQUE Titanium Dioxides; CADMOLITH Reds and Yellows; SUNOLITH Lithopones. Write for detailed specifications today.

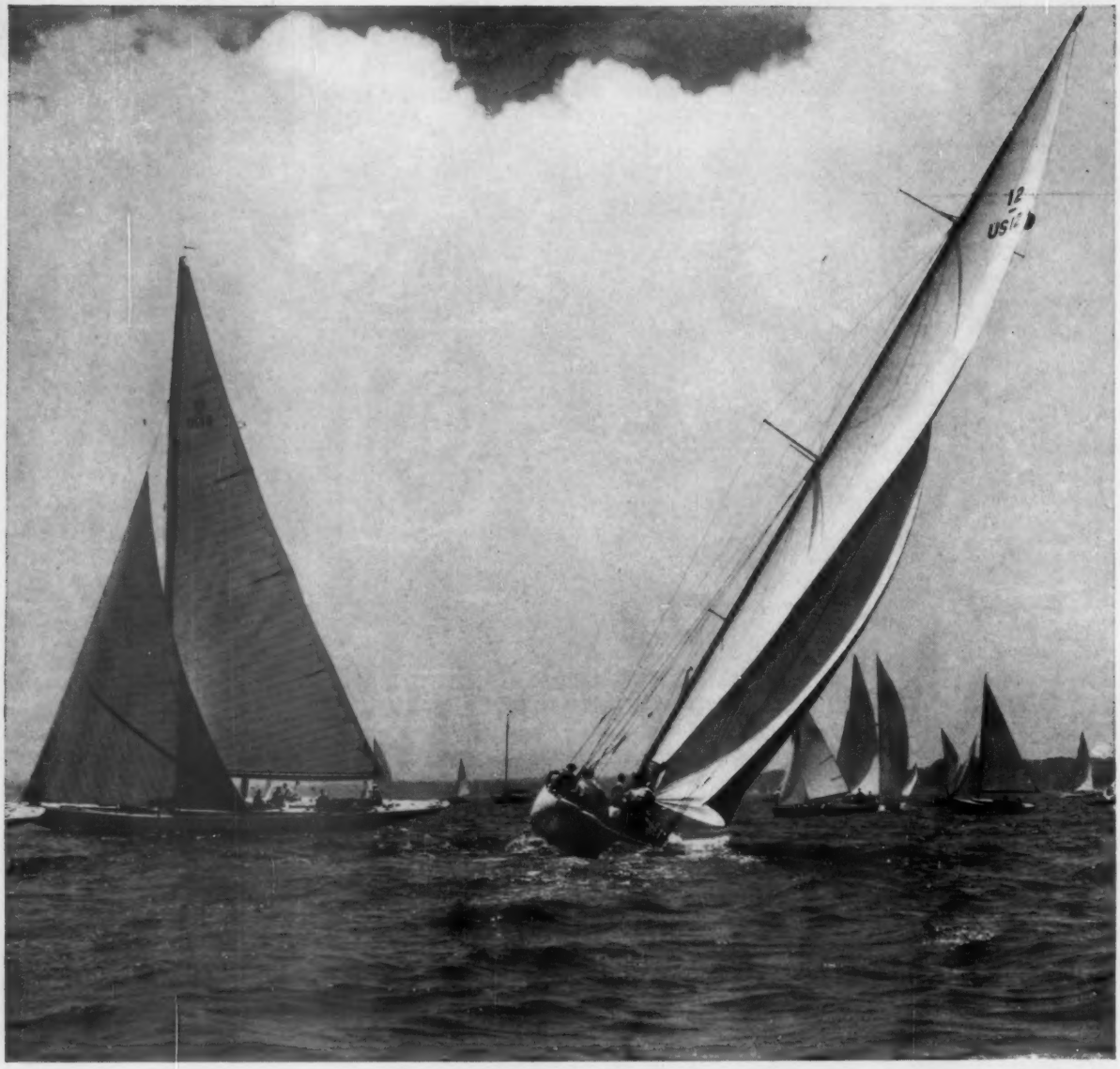
THE GLIDDEN COMPANY

Chemicals • Pigments • Metals Division

Baltimore, Maryland • Collinsville, Illinois • Hammond, Indiana • Scranton, Pa.

CHEMICALS
PIGMENTS
METALS

QUALITY
Glidden
PRODUCTS



Morris Rosenfeld Photo

TRY A NEW TACK

STAYBELITE® RESIN has proved its value as a quality tackifying agent and plasticizing aid wherever improved tack, better pigment dispersion, resistance to oxidation, lack of odor and pale color are important in rubber compounding.

In tire compounding, cements, footwear, floor tile, sponge and other rubber compositions, the addition of Staybelite to the formulation helps provide better control over processing, manufacturing economies, and a higher quality finished product. In unicellular sponge, for example, Staybelite's pigment-wetting ability means more uniform cell structure, more "blow" with a given amount of certain gas-producing materials.

For information on the diversified uses of Staybelite Resin in rubber compounding, write for technical booklet.

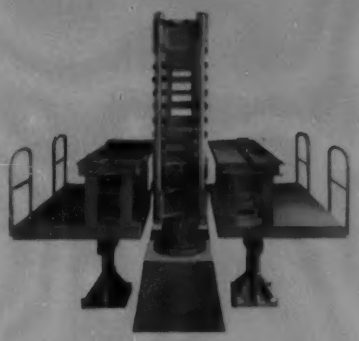
Naval Stores Department

HERCULES POWDER COMPANY

INCORPORATED

918 Market Street, Wilmington 99, Delaware

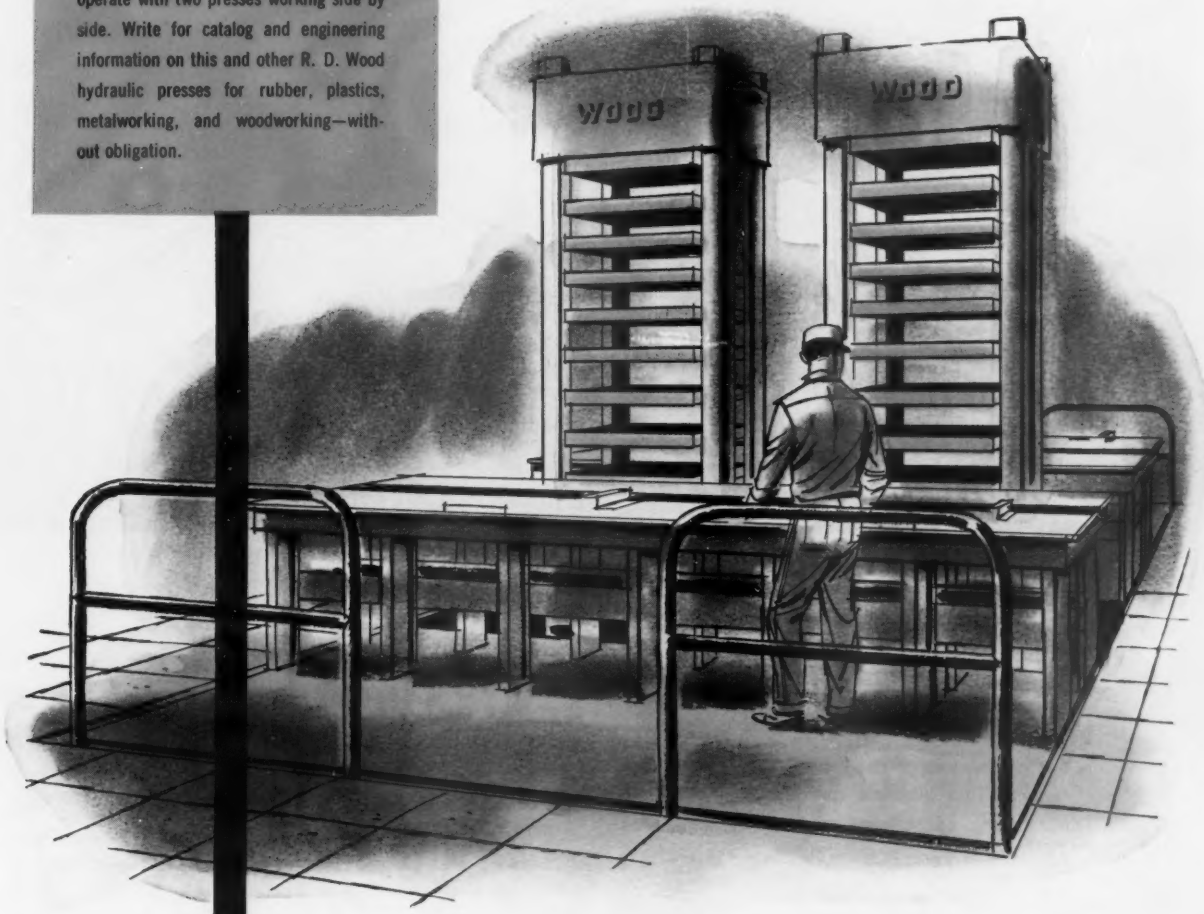
IR55-1



192-ton Multiple Opening Platen Press. Designed for molding rubber products. This press may be operated from an individual self-contained pumping unit or a central accumulator system. Two elevators operate with two presses working side by side. Write for catalog and engineering information on this and other R. D. Wood hydraulic presses for rubber, plastics, metalworking, and woodworking—without obligation.

The nameplate is your guarantee of value

When you buy an R. D. Wood press, you can take *full value* for granted. In more than 150 years, the R. D. Wood nameplate has never appeared on a product of inferior quality. It is your guarantee of sound design, premium materials, superlative craftsmanship. It is your assurance also of smooth, trouble-free performance, high productivity, long life and production economies.

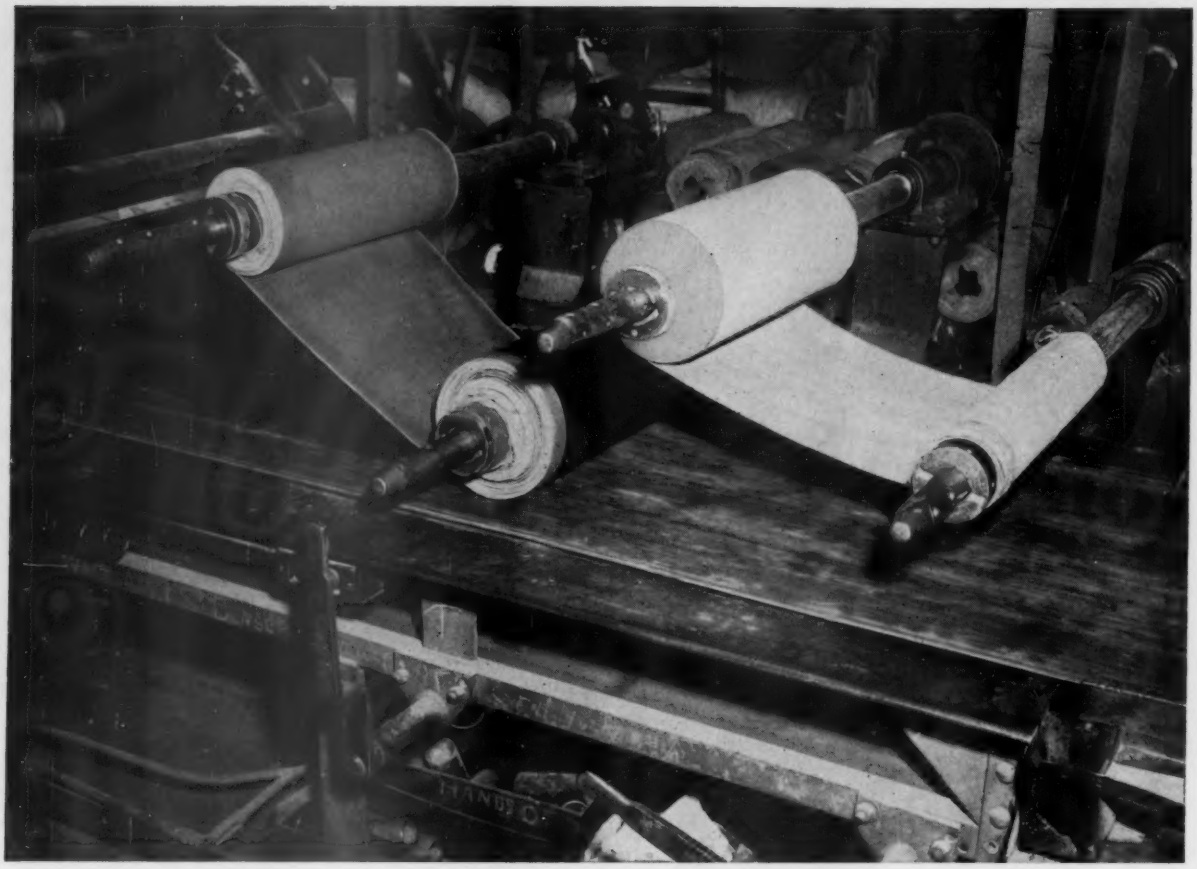


R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING • PHILADELPHIA 5, PENNSYLVANIA

Representatives in Principal Cities

MAKERS OF HYDRAULIC PRESSES AND VALVES • FIRE HYDRANTS • CAST-IRON PIPE • GATE VALVES • GAS PRODUCERS • ACCUMULATORS



CLIMCO PROCESSING—

To Prevent Sticking

At the bias cutter, cut bands will not stick if they are rolled into liners.

Besides preventing adhesions, Climco Processed Liners help all along the line to eliminate tie-ups that cost production time and money. Lint and ravelings, air, moisture, sunlight are excluded — oxidation, mold and bloom are prevented. Tackiness is preserved.

Labor and power are saved, stock losses are reduced and accurate gauges are maintained more easily. Latitude in compounding is enlarged.

For over 31 years, Climco Processed Liners have been used to protect stocks and take the "kinks" out of production lines. Give Climco Processed Liners a trial in your plant.

THE CLEVELAND LINER & MFG. CO.
5508 Maurice Ave. • Cleveland 27, Ohio

GET THE FULL STORY ON CLIMCO PROCESSING

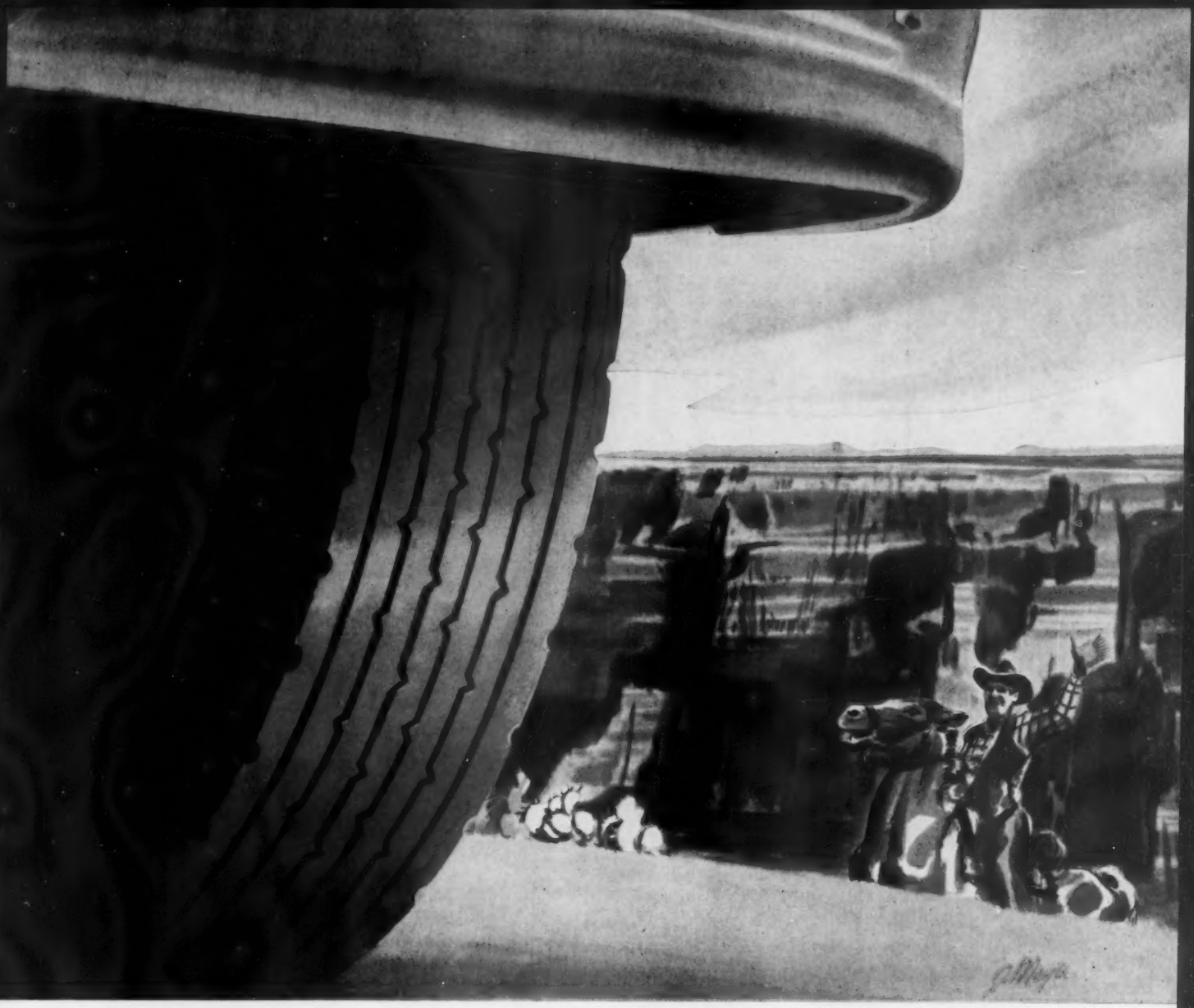
Illustrated booklet tells about Climco Liners and Linerette separating paper. Tells how to get better service from liners. Write for your copy now.

LINERETTE INTERLEAVING PAPER
Treatment Contains
NO OIL OR WAX
Samples on Request

CLIMCO
PROCESSED LINERS

FOR FASTER, BETTER PRODUCTION AT LOWER COST

THE CLEVELAND LINER & MFG. CO. CLIMCO CLEVELAND OHIO, U.S.A.



RELIABLE ZINC OXIDES

AZO-ZZZ-44 and AZO-ZZZ-55 assure good dispersion and easy processing because of their uniform particle size and absence of extreme fines. With AZO-ZZZ-11, 22, 33, (Acicular types) and special grades, a complete range of zinc oxides is offered for every rubber requirement.

A RELIABLE SOURCE

American Zinc assures an uninterrupted supply of zinc oxide. Recent discovery and development of a new, large ore body, added to previous American Zinc reserves, provides sufficient ore to last many years at the current rate of production.

AZO ZZZ-44 ZZZ-55

AMERICAN ZINC SALES COMPANY

distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

COLUMBUS, OHIO • CHICAGO • ST. LOUIS • NEW YORK

Now! Hot Stretch your Nylon Tire Cord

at

CONSTANT *Temperature*
CONSTANT *Time*
CONSTANT *Tension*
VARIABLE *Line speeds*

IOI's *new* ROLLEVATOR OVEN* *eliminates need of continually balancing 3-T's... enables you to set for optimum results and keep them constant*

*Trade Mark

THE ROLLEVATOR OVEN is an achievement accomplished by IOI as the result of more than four years of engineering and construction of full width, high tension equipment for dipping and hot stretching nylon fabric. It takes the 3 T's out of the category of variables and makes them constants. No longer must the 3 T's be continually balanced. Now you can hot stretch nylon at *constant* temperature, *constant* time and *constant* tension at *any* line speed.

Fast or slow, start-up or shutdown, the oven temperature is always the same—no more costly cold-air purges for shutdowns—no more elaborate control equipment—no reason for varying the oven temperature. There is but one temperature that is best for stretching nylon fabric and the Rollevator Oven enables you to set for that temperature and forget about it from that point on!

What about time? With temperature constant, hot stretch exposure time can not vary with line speed. The unique design of the Rollevator Oven automatically insures that each and every yard of fabric is hot stretched for the same length of time at the optimum temperature, at any line speed.

Tension, the third vital quality factor, is also held constant in this Industrial Ovens system. More closely so and at higher limits than ever before, because of improved design in the hold back and pull roll stands.

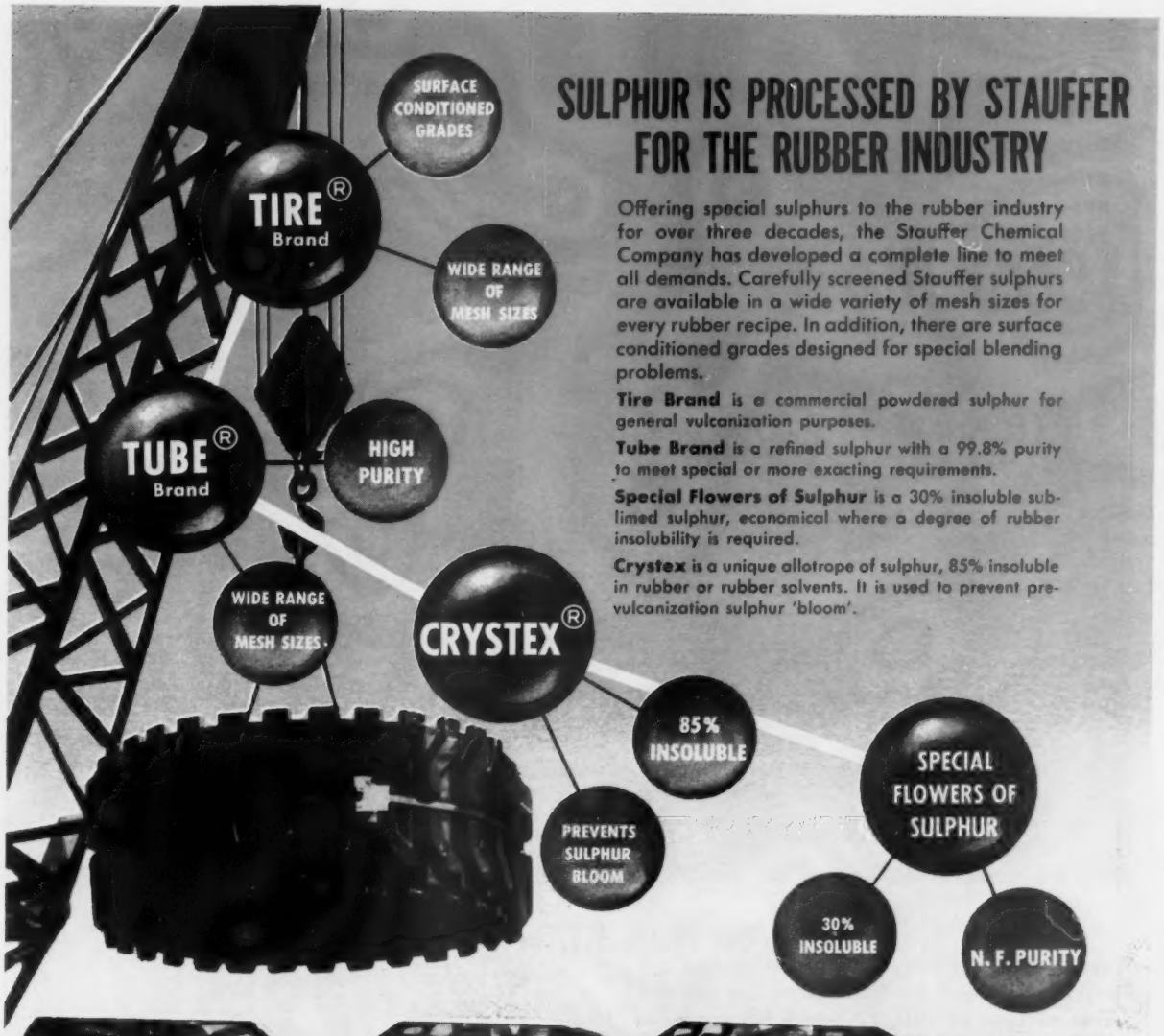
*Patent applied for.

Get the full story on this completely new Rollevator Oven system. Write, wire or phone:

INDUSTRIAL OVENS, INC.

IOI ENGINEERING VERSATILITY

13803 TRISKETT ROAD CLEVELAND 11, OHIO



SULPHUR IS PROCESSED BY STAUFFER FOR THE RUBBER INDUSTRY

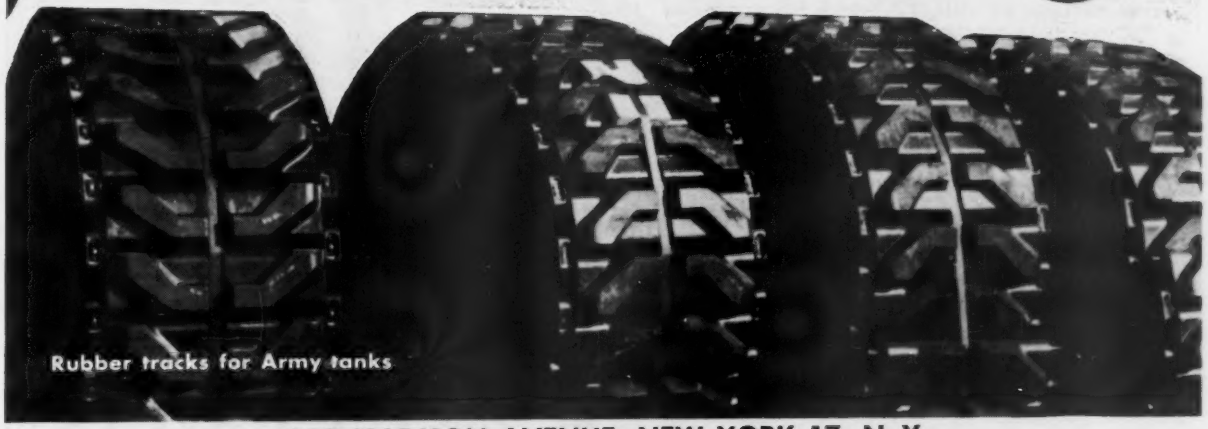
Offering special sulphurs to the rubber industry for over three decades, the Stauffer Chemical Company has developed a complete line to meet all demands. Carefully screened Stauffer sulphurs are available in a wide variety of mesh sizes for every rubber recipe. In addition, there are surface conditioned grades designed for special blending problems.

Tire Brand is a commercial powdered sulphur for general vulcanization purposes.

Tube Brand is a refined sulphur with a 99.8% purity to meet special or more exacting requirements.

Special Flowers of Sulphur is a 30% insoluble sublimed sulphur, economical where a degree of rubber insolubility is required.

Crystex is a unique allotrope of sulphur, 85% insoluble in rubber or rubber solvents. It is used to prevent pre-vulcanization sulphur 'bloom'.



Rubber tracks for Army tanks

380 MADISON AVENUE, NEW YORK 17, N. Y.

221 N. LaSalle Street, Chicago 1, Illinois · 636 California Street, San Francisco 8, California
326 S. Main Street, Akron 8, Ohio · 824 Wilshire Boulevard, Los Angeles 14, Calif.
8901 Hempstead Road, Houston 8, Texas · North Portland, Ore.

STAUFFER Stauffer CHEMICALS SINCE 1885 CHEMICALS

Need more protection?

STABILITE*

THE ANTIOXIDANT WITH UNIQUE CHARACTERISTICS

When looking for the most economical and outstanding antioxidant for both natural and synthetic rubber, consider STABILITE, which has, combined in one material, the following characteristics:

1. *Protection against oxidation and heat, sunchecking and mechanical flexing.*
2. *Distinct softening effect on uncured rubber or GR-S, resulting in better processing and dispersion, smoother calendering and tubing and at the same time without effect on modulus at cure.*
3. *The unique property of increasing the effect of most commercial antioxidants when used in conjunction with* STABILITE. *The effect of such mixtures is greater than the components.*

For the protection of your rubber products use STABILITE; for maximum resistance to oxidation, heat, sunchecking and mechanical flexing replace part of your present antioxidant with STABILITE.

*MANUFACTURED BY CHEMICO, INC.
THE C. P. HALL CO. *Manufacturing Agents*

The C. P. Hall Co.
CHEMICAL MANUFACTURERS

AKRON, OHIO LOS ANGELES, CALIFORNIA CHICAGO, ILLINOIS NEWARK, N. J.

This forging will be *Another*
BRIDGWATER TIRE MOLD

MAKING its *first* stop on the production line of Bridgwater's Athens Machine Division, in Athens, Ohio, is this rough forging for an automotive tire mold. 10 to 14 stops later—depending on its type and size — the forging will emerge, mirror-polished, precision engraved . . . a *finished* Bridgwater Tire Mold. It is ready, then, for the production line of a tire plant — perhaps yours — where its higher quality and greater workability will contribute conspicuously to smoother, speedier flow of quality tires.

Typical of our "scope" at Athens is that this Vertical Boring Mill is only one of 11 available in our plant. Typical also of Bridgwater's *continuing* efforts to streamline mold making processes, is that these mills are now being fitted with tracer control equipment which will substantially reduce the time — and cost — of the machining operation shown here.

Tire mold production at Athens is unique in that our *entire* organization of trained technicians and metalworking craftsmen — all equipment and machines — much of it our own special design — and our systems of production "flow" are unhampered by any other manufacturing obligation. In fact, the Athens Machine Company is the *only* plant in the world devoted exclusively to tire mold making.

That's why, at Athens, you can get precision-made molds of any type and size, in engraved steel, cast iron or aluminum, *faster*, and at costs that reflect favorably in a period of adjusting economy.

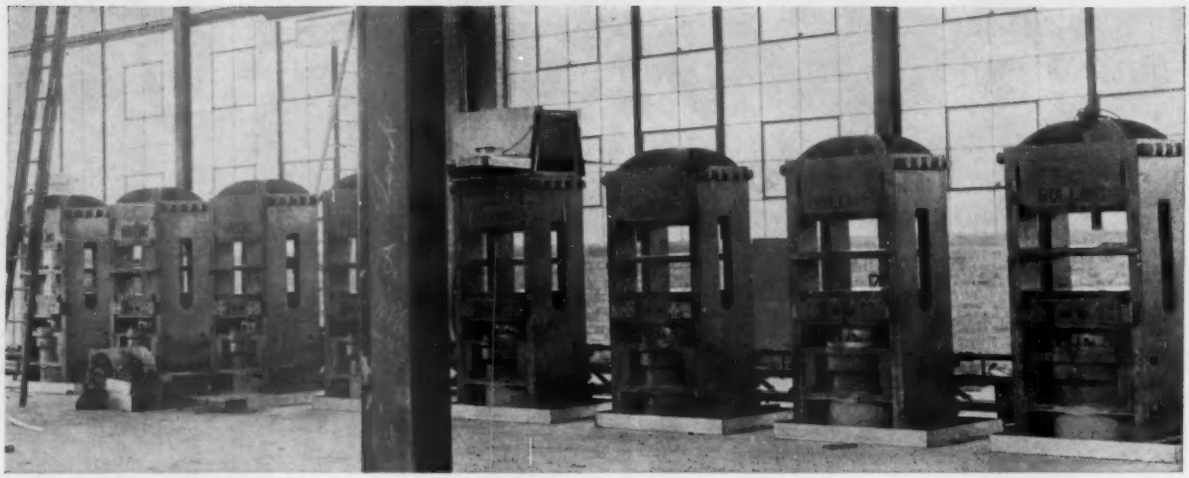
ATHENS MACHINE DIVISION

BRIDGWATER MACHINE COMPANY

Akron, Ohio

1896

For MODERN PRECISION MOLDING PRESSES
come to *Headquarters!*



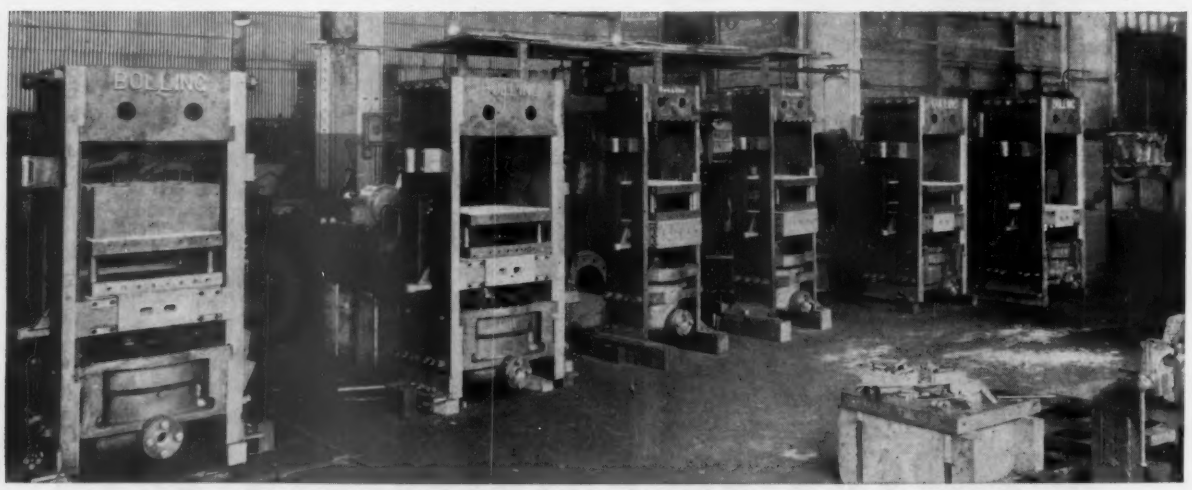
A portion of the press line in one of 1954's most modern new precision molding plants. All basic equipment, intensive mixers, mills, calenders and presses by BOLLING.

Since 1923 the world's most complete line of standardized hydraulic post type molding presses – 17 frame sizes from 12" x 12" to 60" x 60".

And now – super power slab side models in a complete range of sizes from 20" x 20" to 48" x 48" give you utter precision and everlasting staying quality. They offer you a lot of features that you get only from Bolling.

STEWART BOLLING & COMPANY, INC.
3194 EAST 65th STREET • CLEVELAND 27, OHIO

• INTENSIVE MIXERS AND MILLS •
CALENDERS • REFINERS • CRACKERS
HYDRAULIC PRESSES • PUMP UNITS
BALE SLITTERS • SPEED REDUCERS



The beginning of one of 1955's most modern new molding plants.

HEAT V LIGHT

HARSHAW VINYL STABILIZERS

for the vinyl plastic and coating industries

Important additives for processing and stabilizing clear and opaque vinyls—

CALENDERED FILMS AND SHEETS • EXTRUSIONS RIGIDS AND FLEXIBLE PLASTISOLS • ORGANOSOLS • COATINGS

CADMIUM 2-V-4

Leading heat and light stabilizer for clear or opaque stock, an organic liquid complex containing no disadvantageous soapy component. Unequalled for stabilizing against effects of sunlight or outdoor aging.

BARIUM-CADMIUM 128-V-5

Leading combination of coprecipitated laurates for outstanding performance, where lubricating advantages are required. Generally 30% more effective than common barium-cadmium laurates.

Write for a Vinyl Stabilizer Check List that you may use to detail as much as possible your particular requirements.

A practical stabilizing system will be suggested promptly, based on our experience with the various Vinyl Polymers and Copolymers and with the different Plasticizers, for your processing and product end-use requirements.

THE HARSHAW CHEMICAL CO.
CLEVELAND 6, OHIO

Best effects are attained for particular requirements by combining 2-V-4 or 128-V-5 in a stabilizing system with one or more of the following three stabilizers.

BARIUM 1-V-4

Compatible barium compound, minimum effect on viscosity. Permits processing at higher temperatures.

ORGANIC 8-V-1

Chelating agent, more than two times as effective as common organic phosphites. Inactivates harmful by-products to boost stability. Contributes to top clarity.

CADMIUM 22-V-1

For clear rigids or opaque. Stabilizes unplasticized resin efficiently and economically, with minimum effect on physical properties of product. Used with organic 7-V-4.

CADMIUM 28-V-2

For rigids, opaque to translucent. Stabilizes unplasticized resin efficiently and economically, with minimum effect on physical properties of product.

Stabilizing Systems developed for Harshaw Customers, for special processing and finished product properties, may contain one of the following fifteen stabilizers.

ZINC 9-V-1: Organic liquid complex containing no disadvantageous soapy component used in selected formulations.
CADMIUM 2-V-7: For modified solutions and organosols.
CADMIUM 228-V-1: For rigids, clear to translucent.
CADMIUM 24-V-1: Organic liquid complex for highest attainable clarity, used principally with dispersion resins.
CADMIUM 2-V-8: Selected laurate, used principally with low fusing resins.
BA-CD 12-V-5: Coprecipitated laurate.
ORGANIC 7-V-1: Epoxy assistant.
ORGANIC 7-V-2: Epoxy assistant.
ORGANIC 7-V-4: Epoxy assistant, for rigids.
BARIUM 1-V-3: Dispersible stearate, to contribute lubricity with barium effects.
BARIUM 1-V-6: For asbestos filled tile.
BARIUM 1-V-7: Liquid, for modified plastisols and organosols.
CALCIUM 5-V-1: Dispersible stearate, to contribute with calcium effects.
CALCIUM 5-V-2: Low melting stearate, to reduce internal friction effects.
CA-ZN 59-V-4: Non toxic metal content.

How many pounds are sirloin steak?

☐ 250 lbs. ☐ 150 lbs. ☐ 50 lbs.

The American Meat Institute tells meat packers and housewives how much "eatin' meat" there is in a 1000 pound steer—40 different cuts from a side of beef—how many pounds of hides, hoofs and fats.

Courtesy American Meat Institute

"eatin' meat" CIRCULATION

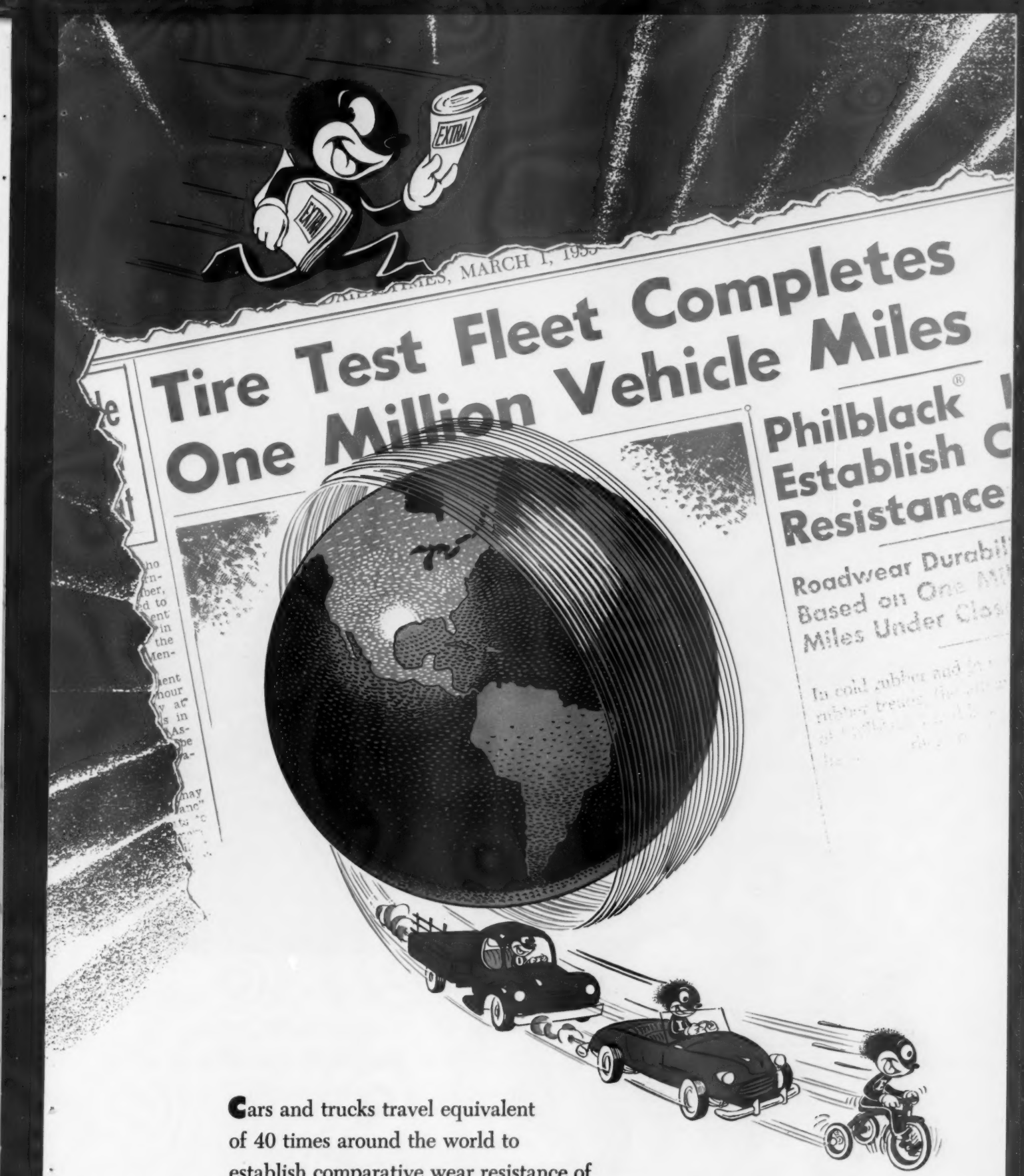
Experienced space buyers recognize that the entire circulation of a publication isn't necessarily all "eatin' meat" for every advertiser. It's who, where and how that counts, not end figures. Careful study of all available circulation FACTS as related to markets is required to appraise media for its advertising value.

The audited information in A.B.C. reports for business publications includes: A breakdown of subscribers by occupation or kind of business • Location of subscribers by states or provinces • How the circulation was obtained • How much subscribers paid • How much paid circulation • How much unpaid distribution • What percentage of subscribers renew • How many in arrears.

By using audited information from A.B.C. reports as a basis for media decisions, you can most accurately judge media for their value to your business and *know* what you get—how much "eatin' meat"—for your advertising investment. This business publication is a member of the Audit Bureau of Circulations. Ask for a copy of our A.B.C. report and then study it.

RUBBER AGE 250 WEST 57th ST. NEW YORK 19, N. Y.

A.B.C. REPORTS—FACTS AS A BASIC MEASURE OF ADVERTISING VALUE



Cars and trucks travel equivalent
of 40 times around the world to
establish comparative wear resistance of
Philblack O · Philblack I · Philblack E
in cold rubber and natural rubber tire treads.

Roadwear Durability Index

based on one million test vehicle miles under closely supervised conditions

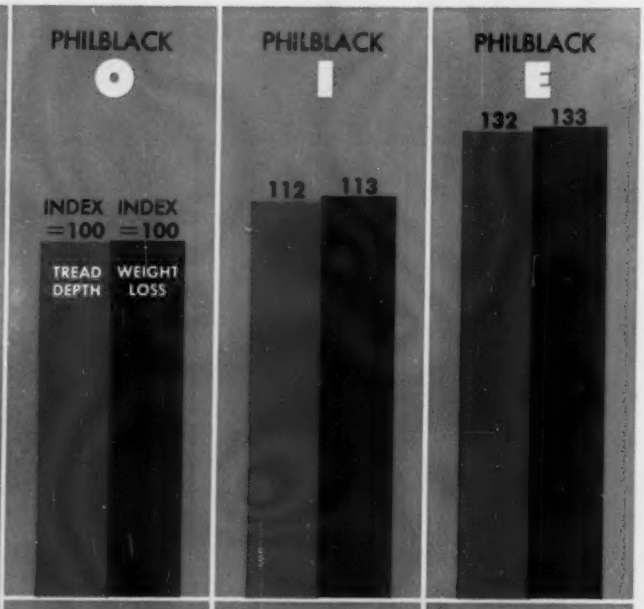
In cold rubber treads

Philblack O is equal to or superior to competitive HAF Blacks.

Philblack I compares favorably with competitive ISAF Blacks.

Philblack E topped all other blacks in resisting road wear.

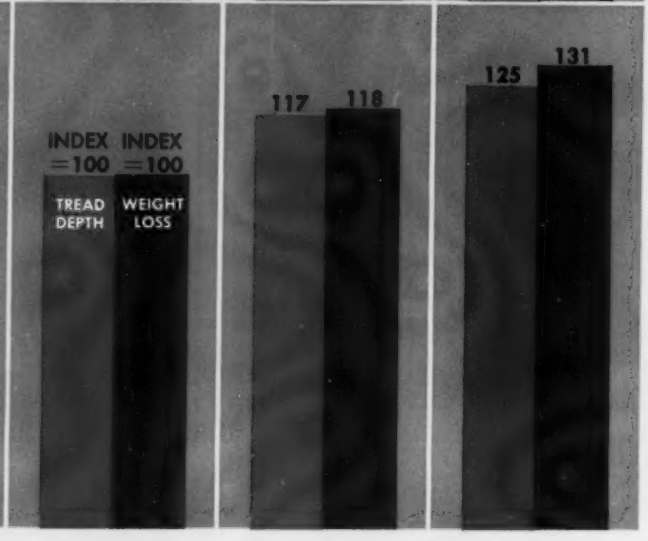
No tread cracking was experienced with any of the Philblacks — O, I or E.



In natural rubber treads

The advantages of Philblack I and Philblack E in natural rubber treads can readily be seen in these roadwear results.

Philblack E is notable for the resistance it imparts to chunking, tread cracking, and to cut and crack growth.



Get the full story on the Philblacks. Our long experience with elastomers and carbon black is at your service. Consult your Philblack Technical Representative.

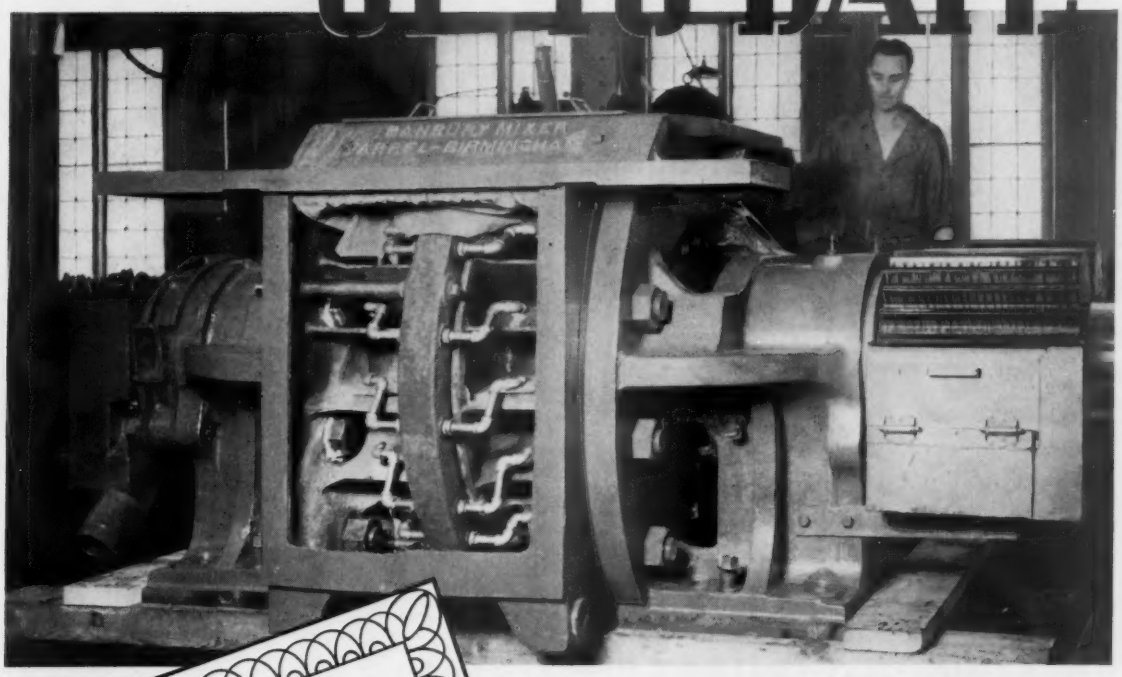
PHILLIPS CHEMICAL COMPANY

A Subsidiary of Phillips Petroleum Company

PHILBLACK SALES DIVISION • 318 WATER STREET • AKRON 8, OHIO

EXPORT SALES: 80 Broadway, New York 5, N. Y. WEST COAST REPRESENTATIVE: Harwick Standard Chemical Company, Los Angeles, California. CANADIAN REPRESENTATIVE: H. L. Blachford Ltd., Montreal and Toronto. WAREHOUSES: Akron, Boston, Chicago, Trenton, Los Angeles and Toronto.

How Farrel-Birmingham rebuilding brings your Banbury® UP TO DATE



Banbury mixer bodies rebuilt by Farrel-Birmingham carry a new machine GUARANTEE

At Farrel-Birmingham, the Banbury mixer is constantly being improved in design and materials to keep pace with tougher service demands in the rubber industry, and the severe duty encountered in the production of certain types of plastic materials.

It will pay you to remember this when your Banbury mixer needs rebuilding, because the modern features of design and improved materials, which are now incorporated in new Banburys are readily adaptable to existing machines. These improvements can mean higher operating efficiency and greater wearing qualities for your Banbury mixer.

Remember too, that the use of our special equipment and facilities in rebuilding work assures both accuracy and quick service. This service is further facilitated by the largest existing stock of rotors, bodies and other parts. Complete bodies can be shipped from stock—from our Buffalo plant for western points and from our Derby plant for eastern points.

For details, contact any of the offices listed.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONN. (REgent 4-3331)

AKRON, OHIO, 2710 First National Tower (POrtage 2-8871)
CHICAGO, ILL., 120 South LaSalle Street (ANdover 3-6434)
LOS ANGELES, CALIF., 2032 Santa Fe Avenue (Lafayette 3017)
HOUSTON, TEXAS, 860A M & M Building (CApitol 6242)

Farrel-Birmingham®

INTEGRATED SERVICE

MACHINERY & EQUIPMENT
PLANT DESIGN & LAYOUT
PROCESS ENGINEERING
RAW MATERIAL SOURCES

FOR RUBBER
PLASTICS
CHEMICALS

CONTINENTAL MACHINERY COMPANY, INC.

AND ASSOCIATED ENGINEERS AND ARCHITECTS
261 BROADWAY, NEW YORK

Telephone WOrth 2-1650

CABLE—"CONTIMAC" NEW YORK

ANOTHER QUALITY CHEMICAL BY GENERAL TIRE

KURE-BLEND MT®

. . . a true masterbatch providing excellent dispersion

Kure-Blend MT is a latex-compounded masterbatch containing 50% Tetramethyl Thiuram Disulfide and 50% GR-S Type Rubber. If you want the ultimate in fast easy mixing and excellent dispersion, use Kure-Blend.

For sample and reference data on Kure-Blend MT write to The General Tire & Rubber Company, Chemical Division, Akron, Ohio, or our

Sales Agents—Harwick Standard Chemical Co., U. S. A.
R. M. Ferguson Co., Canada.
Binney & Smith International Inc., Export.

Creating Progress Through Chemistry

General Tire also produces . . .

Vygen* (Polyvinyl Chloride) • Gen-Flo* (Paint Latex)
Gen-Tac* (Vinyl Pyridine Latex) • Ko-Blend® (Insoluble Sulfur Masterbatch)
• Glykon* (Polyester Resin) • Polystop® (GRS Shortstop)

*T. M. G. T. & R. Co.

Chemical Division
GENERAL
THE GENERAL TIRE & RUBBER CO.
KURE-BLEND MT

* it's beaded it pours!

a new development in the rubber industry

DETERO WAX

SPECIALLY DESIGNED WAX *to PROTECT RUBBER*

- BEADED WAX makes measuring and handling easier.
- Cuts working time—Cuts cost!
- Disperses easily and uniformly.
- Insures a film of good pliability and maximum durability.
- Blooms uniformly in hot or cold weather.
- Gives maximum ozone resistance.
- Various grades available to suit every wax requirement in the RUBBER and PLASTICS industry.

MANUFACTURERS, TECHNOLOGISTS *SPECIFY . . . DETERO WAX*

Detailed information and samples on request.
Inquiries answered immediately without obligation.

***RUBBER'S BEST FRIEND**

Process patent applied for.

a product of . . . American Maintenance Supply Co.

236 W. NORTH AVE. — CHICAGO 10, ILL.

Give your products chemical resistance—

USE

HYPALON®

(CHEMICAL RUBBER)

for long service in contact with oxidizing chemicals

- The resistance of HYPALON to sulfuric acid, chromic acid and hypochlorite solutions is particularly outstanding.
- Applications include acid hose tubes, pump liners and impellers, valve diaphragms, rolls, linings and coatings.

See Rubber Chemicals Division Reports:

BL-261 Chemical Resistance of Neoprene, HYPALON and natural rubber.

BL-271 Effect of Chemicals and Solvents on HYPALON.

E. I. du Pont de Nemours & Co. (Inc.)
Elastomers Division

DISTRICT OFFICES:

Akron 8, Ohio, 40 E. Buchtel Ave. ..... POrtage 2-8461
Atlanta, Ga., 1261 Spring St., N. W. ..... EMerson 5391
Boston 5, Mass., 140 Federal St. ..... HAncock 6-1711
Chicago 3, Ill., 7 South Dearborn St. ..... ANdover 3-7000
Detroit 35, Mich., 13000 West 7-Mile Rd. ..... UNiversity 4-1963
Houston 25, Texas, 1100 E. Holcombe Blvd. ..... JUstin 1432
Los Angeles 58, Calif., 2930 E. 44th St. ..... LOgan 5-6464
New York 13, N. Y., 40 Worth St. ..... COrtlandt 7-3966
Wilmington 98, Del., 1007 Market St. ..... Wilm. 4-5121

Du Pont
HYPALON®
DU PONT
REG. U. S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

WE'RE MOVING!

ATLAS-OMETERS

FADE-OMETERS . . .
WEATHER-OMETERS . . .
LAUNDER-OMETERS . . .

are moving February 15, 1955,
to the new Atlas Plant at
4114 North Ravenswood Avenue,
Chicago 13, Illinois

This entire building will be occupied by Atlas Electric Devices Co. for the manufacturing, testing, and research work of Fade-Ometers, Weather-Ometers, Launder-Ometers, Atlas Scorch Testers, and the Atlas Accelerator. After February 15, 1955, address all communications to the new address.

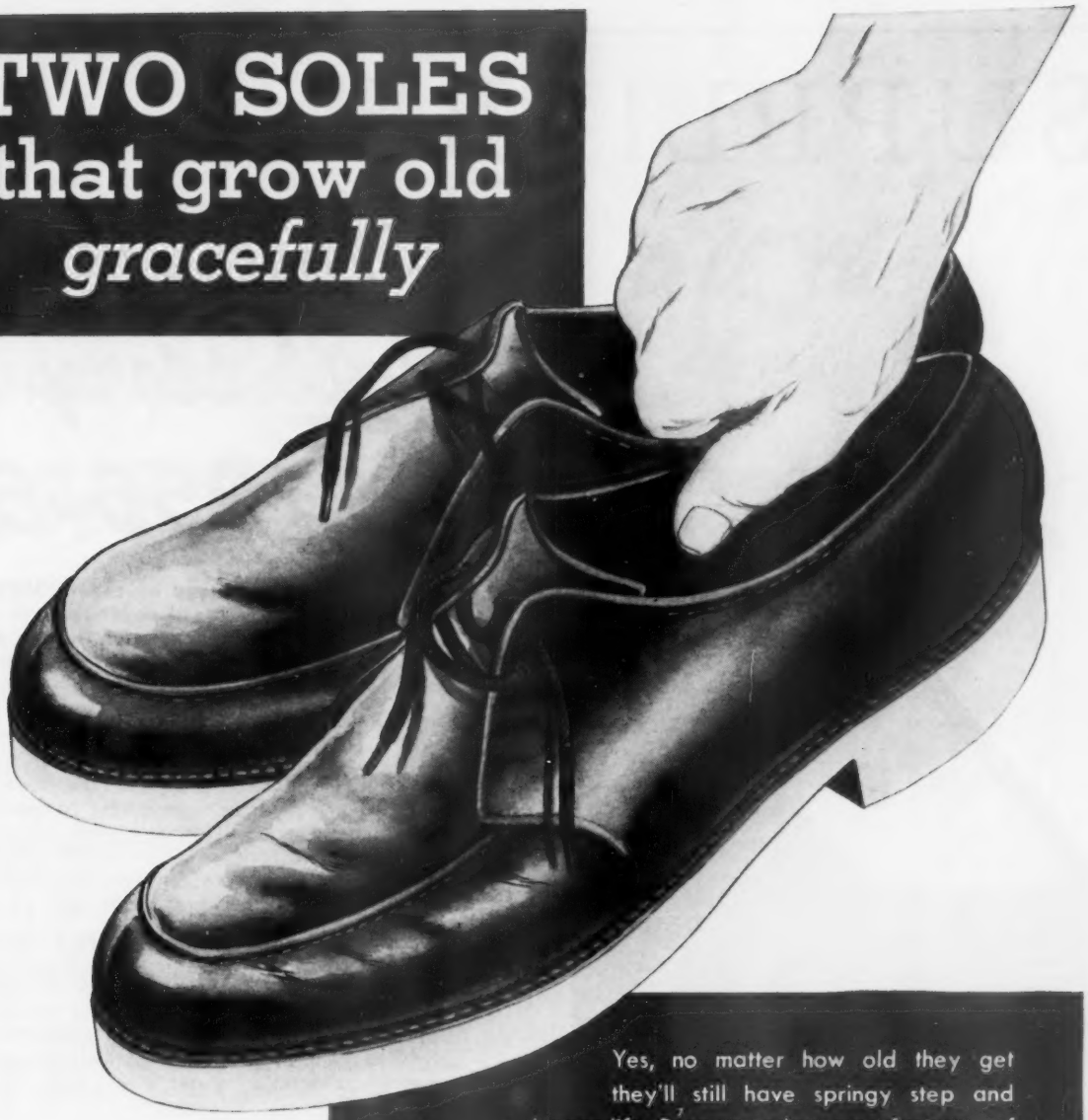
ATLAS ELECTRIC DEVICES CO.
4114 N. Ravenswood Ave., Chicago 13, Illinois, U.S.A.
Telephone EAstgate 7-4520

Sales Representatives:

Charlotte	New York	Philadelphia
San Francisco	Seattle	Pawtucket
Los Angeles	Portland	

and other principal cities throughout the world.

TWO SOLES that grow old *gracefully*



Yes, no matter how old they get they'll still have springy step and longer life. Because today, manufacturers of quality footwear use Neville Resins in compounding synthetic soles and heels, thus improving the properties of their product. They get abrasion resistance, flex-life, high tensile strength and uniform quality in the stock they use.

- *These advantages are obtainable with Neville Resins in processing other rubber products too, such as molded goods, mats, floor tile, wire insulation and mechanical goods in general!*

NEVILLE RESINS

Call us for samples and information

R-54

NEVILLE CHEMICAL CO.

PITTSBURGH 25, PA.

Plants at Neville Island, Pa. and Anaheim, Cal.

SUPPLIERS-

Plan now on full story of 1955-56

Though the 1955-56 issue of the RUBBER RED BOOK will not close until next April, it is not too early to give consideration to the use of space in that issue and to include the necessary amount in your 1955 budget.

The Editors are planning an even larger and more comprehensive 1955-56 RUBBER RED BOOK. Each issue has been more complete than the previous one — has had more pages, more rubber companies and suppliers, more new listings, new sections, improved and expanded sections, new information added. Yes, every new edition is more complete and more useful . . . and users mince no words in telling us so!

The constant improvement in the RUBBER RED BOOK is the key to its solid acceptance by the rubber industry. Add to that the fact that **each advertisement remains effective for two full years** and you have the unbeatable combination of effectiveness and economy! Small wonder that some suppliers use up to 20 pages of advertising to get across every detail of their story.

Make sure that your company is represented with adequate advertising space in the 1955-56 issue. During the two-year life of this edition buying decisions involving more than $4 Billion will be made. Your advertisement in the RUBBER RED BOOK will be just like having your own salesman present when these decisions are being made . . . **but your products may not even be considered if information on them is not available at this critical time.**

Plan now for sufficient space in the next edition to tell the full story of your products . . . your services . . . your equipment. Send in the Space Reservation Coupon (on opposite page) today!

Condensed Schedule of Rates for 1955-56 Edition

1 Page	$175.	2 Pages, each	$170.
½ Page	95.	2 Half Pgs., each	92.
¼ Page	55.	2¼ Pages, each	53.
Colors, Red	extra $65.		
Other Colors	extra 85.		
Bleed Pages	extra 20%		

For complete rates and sizes write for 1955-56 rate card

Published by

RUBBER AGE

250 West 57th Street, New York 19, N. Y.

enough space to tell the your products in the RUBBER RED BOOK

Users Like the RUBBER RED BOOK!

Hundreds of letters are on file attesting to the worth of the RUBBER RED BOOK. Users stress its **practical value** . . the evident **thoroughness** with which each section has been developed . . the intimate **knowledge** of the rubber industry that is so apparent . . the infinite **detail** and wide **variety** of its contents.

All of these combine to make it more than just a directory. It is, in the words of one user, ". . a working encyclopedia of the rubber industry that is indispensable to every department of our plant."

Tenth Issue — 1955-56 Edition

Closing Date for Copy — April 1, 1955

Publication Date — June, 1955

The comments cited are typical of how people feel about the RUBBER RED BOOK, and help to explain why it has become such an important buying influence in the rubber industry. It is reliable and relied upon. That's one of the many reasons why you can present the story of your products in the RUBBER RED BOOK with complete assurance that your advertisement will be seen and acted upon!

Use the SPACE RESERVATION below, or send us your own Purchase Order.

RUBBER AGE, ... 19.....
250 West 57th St., New York 19, N. Y.

You are hereby authorized to insert in the 1955-56 Edition of the RUBBER RED BOOK the advertising of the undersigned to occupy the space of ..... for which we agree to pay $..... as per your 1955-56 rates. (Copy will be sent you before April 1, 1955).

FIRM NAME _____

ADDRESS _____

SIGNED BY _____ TITLE _____

HARCHEM

Announces

THE BIRTH OF —

HARFLEX® 300

. . . A **true** Polymeric . . .
non-migratory plasticizer . . .
with the lowest temperature
flexibility obtainable.

Ideally adapted to applications where permanence and low cold-flex are essential to your finished products. Send for sample.

SEBACATES PHTHALATES ADIPATES

BINNEY & SMITH CO. • Distributor to the Rubber Industry

HARCHEM

25 MAIN ST., BELLEVILLE 9, NEW JERSEY

THE KEY TO HARCHEM® BETTER PLASTICS

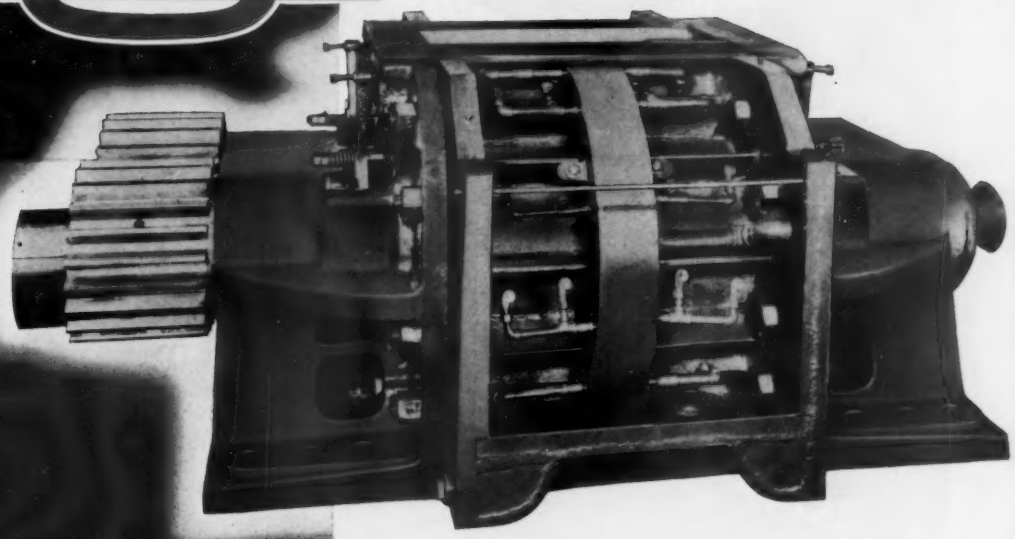
HARCHEM DIVISION
WALLACE & TIERNAN, INC.

Manufacturers of Sebacic Acid

Canadian Distributor: W. C. Hardesty Co. of Canada Ltd., 975 Lakeshore Road, New Toronto, Canada H-1

A SECO REBUILT BANBURY

ESTABLISHED 1868



guarantees new equipment performance

A SECO ESTABLISHED 1868 rebuilt Banbury is backed by the twenty-one years' specialized Banbury rebuilding experience of Interstate Welding Service,* combined with Skinner Engine Company's 86-year history of high-precision machining in the heavy goods industry—your guaranty of the finest of engineering and workmanship.

Rotors, side jackets, rings, bearings, end frames, thrust nuts, door tops, connecting gears—all are carefully examined by skilled technicians and magnafluxed to detect hidden defects. Each worn part is either replaced by a new part or is restored to its original size and contour. All wearing surfaces are thoroughly hard surfaced.

When your Banbury mixer needs repairing or rebuilding, give us a call—one of our engineers will visit your plant and inspect your installation—without cost or obligation to you.

INTERCHANGE PLAN: → **For a minimum of down time, investigate our guaranteed interchange plan.**

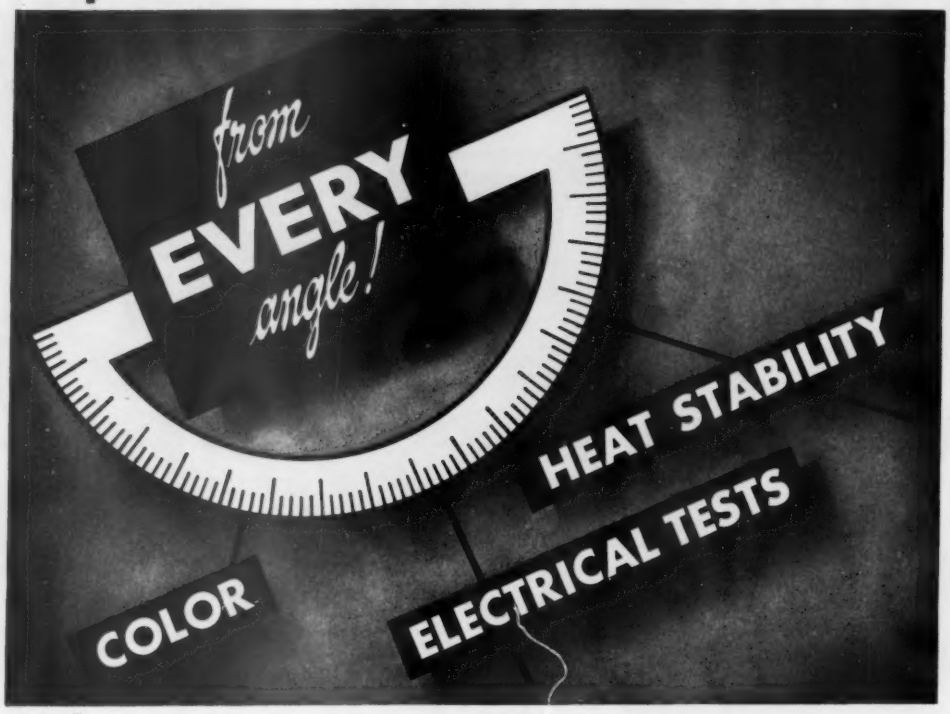
STOCK PARTS: → **All parts in stock, including bodies, for any size mixer.**

SKINNER · ENGINE · COMPANY

(*) NOW THE RUBBER MACHINERY DIVISION OF SKINNER ENGINE COMPANY

SECO ESTABLISHED 1868

RUBBER MACHINERY DIVISION
TELEPHONE ERIE 2-3661
ERIE 6 · PENNSYLVANIA



PIGMENT NO. 33

for Compounding

VINYLS AND SYNTHETIC RUBBER

Sample and technical data sent promptly on request

SOUTHERN CLAYS, Inc.

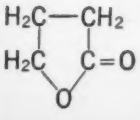
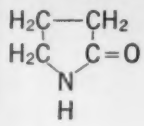
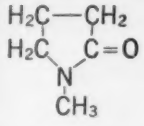
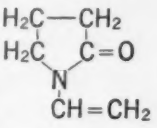
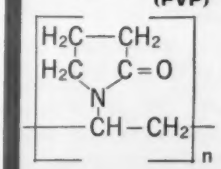
33 RECTOR STREET
NEW YORK 6, N. Y.

gaf's NEW PLANT

FOR HIGH PRESSURE ACETYLENE DERIVATIVES

to be on stream by the end of 1955

the following products are among those which will be available in commercial quantities

PROPARGYL ALCOHOL $HC{\equiv}CCH_2OH$	Three centers of reactivity. Chemical intermediate for pharmaceuticals, agricultural chemicals, etc. Corrosion inhibitor and stabilizer for halogenated compounds.
PROPARGYL HALIDES $HC{\equiv}CCH_2X$	Three centers of reactivity. Chemical intermediate for terpenes and pharmaceuticals, etc. Agricultural uses as soil fumigant, etc.
2-BUTYNE-1, 4-DIOL $HOCH_2C{\equiv}CCH_2OH$	Reacts as a glycol and di-substituted acetylene. Chemical intermediate for solvents, plasticizers, plastics, etc. Corrosion inhibitor and stabilizer for halogenated compounds.
1,4-BUTANE-DIOL $HOCH_2CH_2CH_2CH_2OH$	Reacts as dihydric alcohol. Chemical intermediate for polyesters, polyurethanes, polyamides and cyclic compounds. For use in plasticizers, resins, fibers. Solvent. Humectant.
BUTYRO-LACTONE 	Powerful organic solvent for polyacrylonitrile, cellulose acetate, polystyrene, etc. Selective solvent for acetylene in natural gas. Chemical intermediate for aliphatic and cyclic compounds.
2-PYRROLIDONE 	Polymerizes to high molecular weight, linear, nylon-type, polyamide condensation product. Gives γ-aminobutyric acid and derivatives, also N-acyl lactams.
N-METHYL-2-PYRROLIDONE 	Powerful organic solvent for acrylonitrile polymers and copolymers, cellulose triacetate, etc. Selective solvent for acetylene in natural gas. Spinning agent for polyvinyl chloride solution.
N-VINYL-2-PYRROLIDONE 	Will copolymerize with almost all vinyl monomers. Permits modification of many properties in existing homopolymers. Gives control of hydrophobic and hydrophilic properties of products.
POLYVINYL-PYRROLIDONE (PVP) 	Binder, stabilizer, detoxifier, protective colloid, thickener, film former. Physiologically compatible. Wide solubility range. For use in pharmaceuticals, cosmetics, foods, detergents, dye stripping, synthetic fiber additive, size component, lithography, agricultural chemicals, etc.

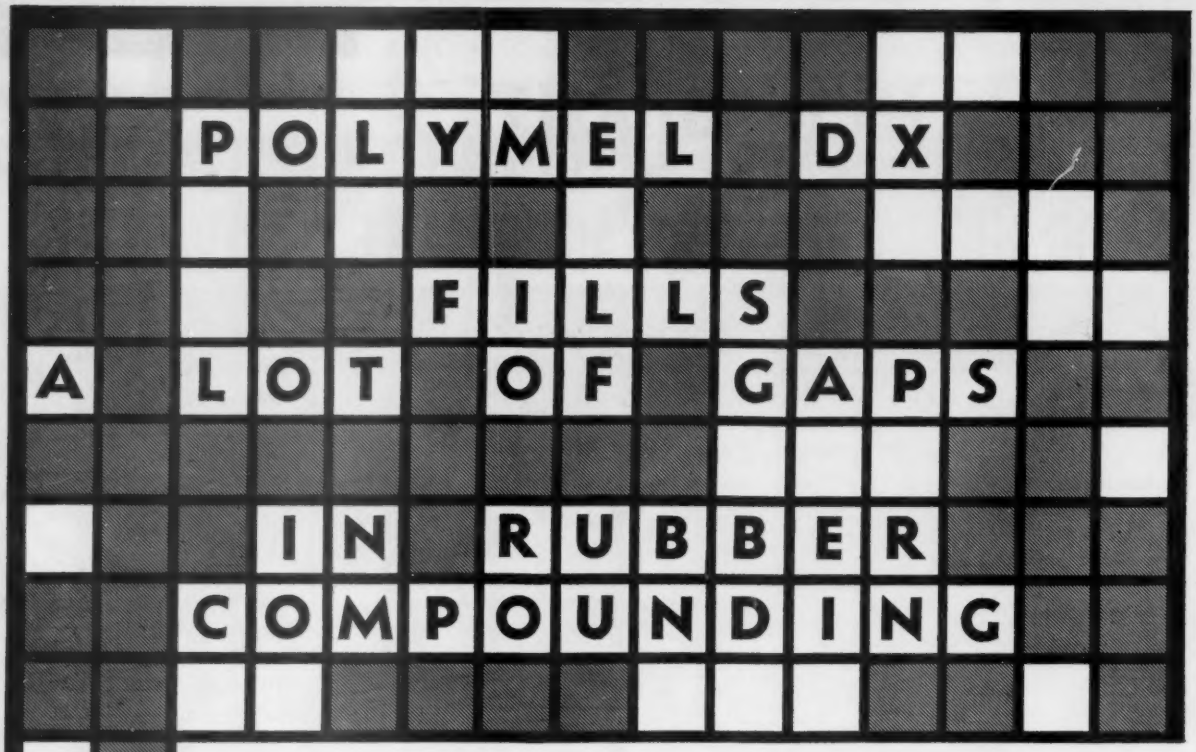
Until the new plant at Calvert City, Kentucky, is completed, these products are available in quantities up to tank cars from the GAF pilot plant and semi-works at Linden, N. J.

For technical information, price schedules and samples write to:

GENERAL ANILINE & FILM CORPORATION
COMMERCIAL DEVELOPMENT DEPARTMENT
435 HUDSON STREET, NEW YORK 14, N. Y.

gaf

From Research to Reality



Few compounding ingredients offer the unusual combination of desirable qualities available in POLYMEL DX. This low-cost styrene copolymer resin functions basically as an efficient plasticizer for natural and synthetic rubber. However, the use of from 5 to 35 parts on the rubber hydrocarbon develops these extra, added benefits—

- ■ **Good flow and sharp detail in molded goods.**
- □ **Easy processing in extruded and calendered stocks.**
- ■ **Thorough dispersion of pigments.**
- □ **Faithful retention of uncured outline.**
- ■ **Reduced nerve and tack, good surface finish.**
- □ **Good electrical properties.**

POLYMEL DX is particularly efficient in high styrene stocks where its use permits *significant reduction* in the quantity of costly high styrene resin *with no appreciable change in physical or processing properties!*

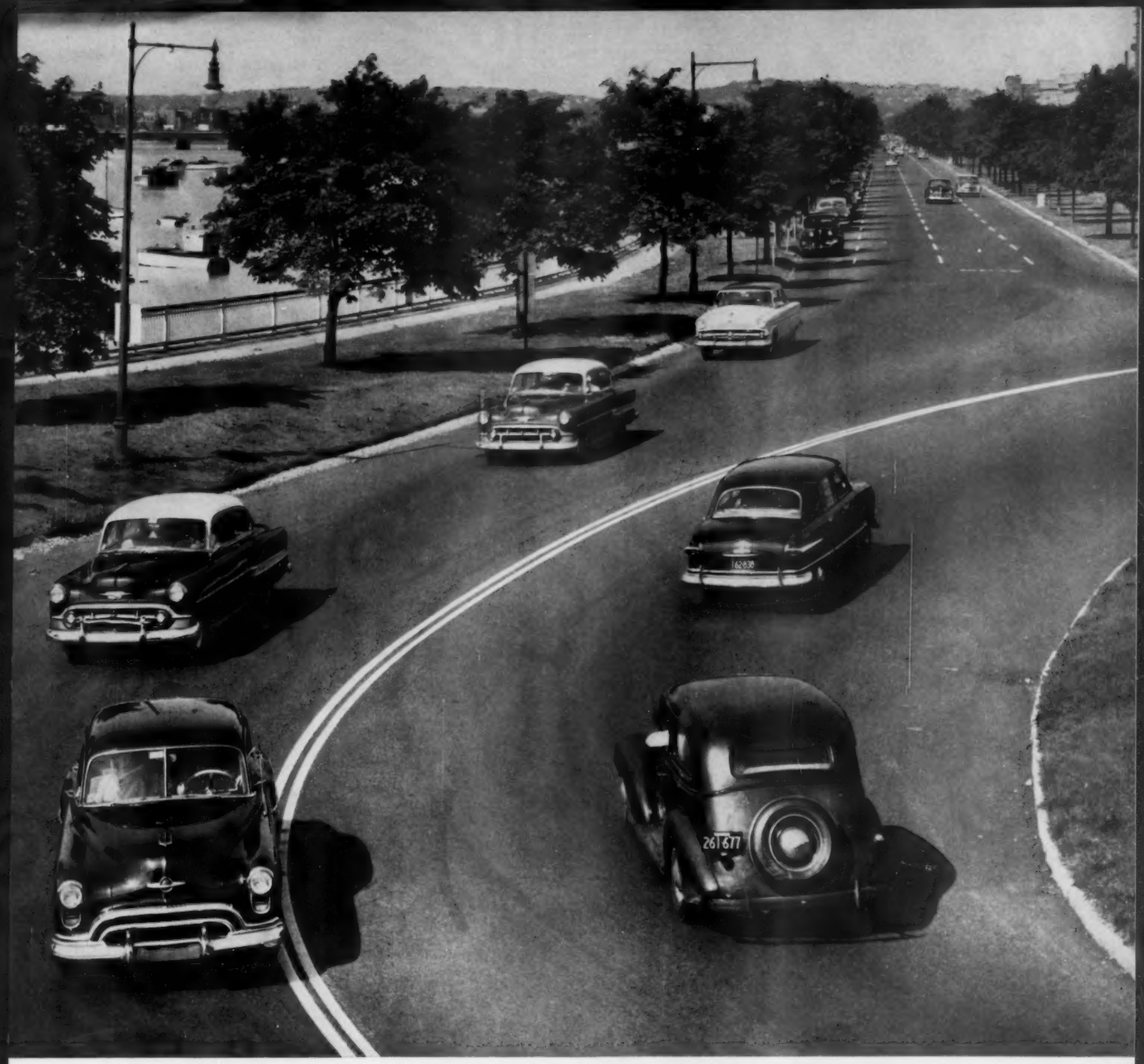
Send today for a generous sample of POLYMEL DX, either in powder or 2" lump form. Better yet, order enough for a trial run.

Prices fob Baltimore		
	1 drum to 4900 lbs.	— .1475¢ lb.
	5000 lbs. to truckloads	— .1425¢ lb.
	Truckloads	— .1375¢ lb.

THE POLYMEL CORPORATION

MANUFACTURERS OF
compounding ingredients for reinforcing, plasticizing, extending and processing natural and synthetic elastomers.

Plaza 2-1240 — 1800 BAYARD ST., BALTIMORE 30, MD.



CUT CORNERS *with Cabot's Vulcan® 6 ISAF* carbon black*

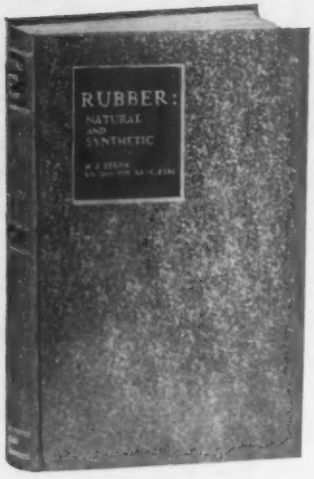
For NO-SQUEAL, LONGER WEARING TIRES,
specify VULCAN 6. Minimize tire squeal and at the same
time improve the wear of low hardness treads.
Vulcan 6 provides a single answer to both problems.
Try Vulcan 6 . . . the CABOT high quality ISAF
standard of the carbon black industry.

GODFREY L. CABOT, INC., 77 Franklin St., Boston 10, Mass.

CABOT

**Intermediate Super Abrasion Furnace*

first edition . . . just published



491 Pages — 200 Illustrations

RUBBER:

Natural and Synthetic

By H. J. STERN
B.Sc., Ph.D., A.R.I.C., F.I.R.I.

Price: $12.00* (in U. S. and Canada)

(Orders for all other countries should be sent with remittance of 75s. 0d. to the publisher: MACLAREN & SONS, LTD., Stafford House, Norfolk Street, London, W.C.2, England).

About the Book—

This book fills the need for an English-language text book on all phases of rubber and rubber products manufacture. As indicated by the chapter heads, the book is of interest to rubber manufacturers, suppliers of chemicals and machinery, rubber technologists and to students of rubber who will find present-day technical procedures clearly defined.

Part I covers natural rubber production, composition, properties and vulcanization as well as compounding ingredients, machinery, reclaiming and latex. Part II covers the development, manufacture and uses of synthetic rubber and latices, synthetic resins and plastics. In addition the manufacture of various rubber products are fully covered, including soles and heels, extruded goods, bonding, hollow goods, sponge and expanded rubber, belting, hose, tires, tubes and hard rubber.

Purchasers in the United States and Canada may use the coupon below or their own purchase orders.

RUBBER AGE, ...19...
250 West 57th St.,
New York 19, N. Y.

Please send me a copy of Stern's "Rubber: Natural and Synthetic" @ $12.00*.

....Remittance enclosed. ....Send invoice.

Name .....

Address .....

.....

(*) Add 3% for N. Y. City addresses.

About the Author—

Dr. Stern has been engaged as a chemist in the rubber industry for more than 25 years and since 1935 has practiced successfully in London as a Consultant. He is the author of "Practical Latex Work" and of many publications concerned with the scientific and technological aspects of natural and synthetic rubber.

SUMMARY OF CONTENTS BY CHAPTERS

Part I

1. Historical Introduction; Mastication; Vulcanization.
2. Plantation Rubber.
3. Natural Rubber: Composition, Reactions, Derivatives.
4. Properties of Vulcanized Rubber.
5. Compounding Ingredients.
6. Rubber Machinery; Solvents and Solutions; Reclaiming.
7. Latex.

Part II

8. Synthetic Rubber (History and Development).
9. Manufacture and Technology of Synthetic Rubbers.
10. Synthetic Rubber Latices.
11. Synthetic Resins; Plastics.
12. Manufacturing Processes (of various rubber products).
13. Testing and Analysis.

Sources of Further Information; Metric Equivalents; Subject Index.

5 MODERN WITCO-CONTINENTAL PLANTS...

Ponca City, Oklahoma—our newest plant

Five good reasons why you can depend on

WITCO-CONTINENTAL CARBON BLACKS

always uniform . . . always dependable

Sunray, Texas

Producing a complete line of carbon blacks under strictest quality controls to fulfill your most rigorous requirements.

Check your needs against Witco-Continental's Channel and Furnace Blacks listed on the next page . . .

Westlake, Louisiana

Eunice, New Mexico

Witco, Texas

Witco-Continental CARBON BLACKS

Recognized *for over twenty-five years* as dependable
Carbon Blacks for rubber products of superior quality.

Channel Blacks

Continental® AA—Easy Processing (EPC)—Witco No. 12
Continental A—Medium Processing (MPC)—Witco No. 1
Continental F—Hard Processing (HPC)—Witco No. 6
Continental R-40—Conducting (CC)

Furnace Blacks

Continex® SRF—Natural Gas Type, Semi-Reinforcing
Continex SRF-NS—Natural Gas Type, Non-Staining
Continex HMF—Natural Gas Type, High Modulus
Continex HAF—Oil Type, High Abrasion
Continex FEF—Oil Type, Fast Extruding
Continex SAF—Oil Type, Super Abrasion

Witco-Continental's technical service staff will be glad to assist you
with your rubber formulation problems.

WITCO CHEMICAL COMPANY

CONTINENTAL CARBON COMPANY

260 Madison Avenue, New York 16, N. Y.

Akron · Amarillo · Los Angeles · Boston · Chicago · Houston
Cleveland · San Francisco · Atlanta · London and Manchester, England

Kenflex Resins

Make Cold GR-S Behave

Kenflex resins are a series of polymers of aromatic hydrocarbons in pumpable liquid or solid form. Highly efficient as a plasticizer at compounding or processing temperatures. You can get desired results with use of smaller quantities with practically no loss of physical properties. Kenflex resins impart excellent electrical properties, have oustanding stability at high temperatures, and have good wetting properties.

Kenflex resins are useful and compatible with natural and all synthetic rubbers, vinyls, polystyrenes, and other polymers.

Kenflex resins are versatile:

- Outstanding processing aid for cold GR-S. Excellent aid for all other GR-S. Overcomes erratic behavior in the plant and has often increased extrusion rate.
- No effect on Butyl cure
- Markedly improve heat aging and ozone resistance in Butyl
- Help control Neoprene scorch and bin set-up
- Excellent mold flow and mold release for high durometer compounds and hard rubbers
- Excellent plasticizer and extender for Hypalon for high temperature service
- Fast and complete fluxing of vinyls

Here is what one user said—"5 parts of Kenflex Resin in one of our GR-S 1502 hose formula made the difference between running and not running."

Send for samples and literature

KENRICH CORPORATION
57-02 48 Street, Maspeth 78, New York

"I'm proud to be a Savings Bonds salesman for Uncle Sam . . ."

CHARLES M. WHITE
President
Republic Steel Corporation

"I'm proud to be a Savings Bonds salesman for Uncle Sam and I urge every business executive in the nation to advance the cause of American enterprise in this way.

"Every one of us at Republic Steel is proud of the results of our Payroll Savings campaign: 96.7 per cent of our employees saving systematically from each pay in U. S. Savings Bonds. These results were possible only because all 68,344 of us at Republic were part of an enthusiastic team. We feel that this is the best way we can demonstrate our appreciation of the efforts to have a sound dollar and a stable economy."

• 96.7% of Republic Steel's 68,344 employees — over 66,000 men and women — are enrolled in the Payroll Savings Plan.

• These 66,000 members of Republic's "enthusiastic team," as Mr. White so aptly terms them, are investing more than $16,000,000 per year in U. S. Savings Bonds.

• In addition to building personal security, these men and women of Republic are making a very important contribution to America's "efforts to have a sound dollar and a stable economy."

Certainly Republic Steel's Payroll Savings record is outstanding — one of the best in the country. But it is not unique. Other companies have comparable records, measured in percentage of employee participation, or in annual Savings Bond purchases.

In every company with a high percentage Payroll Savings Plan you will find that the president or top executive appreciates the importance of the Plan and what it means to personal and national security. He knows that 45,000 companies have Payroll Savings Plans . . . that 8,000,000 employees of these companies are investing more than $160,000,000 per month in Savings Bonds . . . that the cash value of Savings Bonds held by individuals today is more than 36 billion dollars — and rapidly mounting, thanks largely to the steadily increasing family of Payroll Savers. He is 100% behind his company's Payroll Savings Plan, and everybody in the company knows it. He takes personal pride in watching employee participation grow to 60%, 70%, 80%, or, perhaps, the high 90's.

If you are not making this important contribution to America's effort for a sound dollar and a stable economy, a wire or letter to Savings Bonds Division, U. S. Treasury Department, Washington, D. C., will bring prompt cooperation from your State Director. He will show you how easy it is to join Mr. White and thousands of other executives as a Savings Bond Salesman for Uncle Sam, with a company Payroll Savings Plan that you can be proud of.

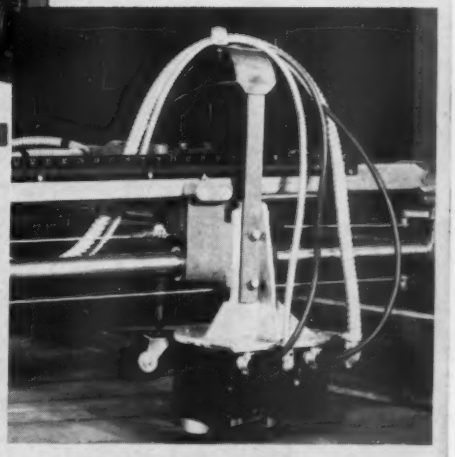
The United States Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

RUBBER AGE

FULLY AUTOMATIC
BIAS CUTTERS

NRM

- SPEED PRODUCTION
- INCREASE ACCURACY
- REDUCE WASTE



ELECTRONIC "CONTROL HEAD" ASSURES FASTER, MORE PRECISE OPERATION

A unique double scanner system, together with many other advanced design features, combine to make this NRM fully automatic horizontal Bias Cutter the most efficient machine available for fabric and ply cutting operations.

Simple, quick adjustments for cutting blocks of stock from 11″ to the maximum required, are a feature of both the 66″ and 72″ tables. Cutting angles are from 45 to 90 degrees. Block widths may be read direct from the calibrated scale on the cutter bar, regardless of the cutting angle. Standard over-all dimensions of tables in 5′ increments are from 20′ to 80′. Speed of the cutting cycle is standard at 20 cuts per minute, within plus or minus 1/32″.

At no obligation we will supply complete details on the fully automatic Bias Cutter. Get the facts and see for yourself *why* stock preparation with NRM Bias Cutters is more accurate and efficient.

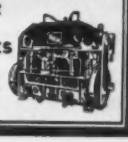
Check your rubber machinery needs against the NRM complete line *Today!*

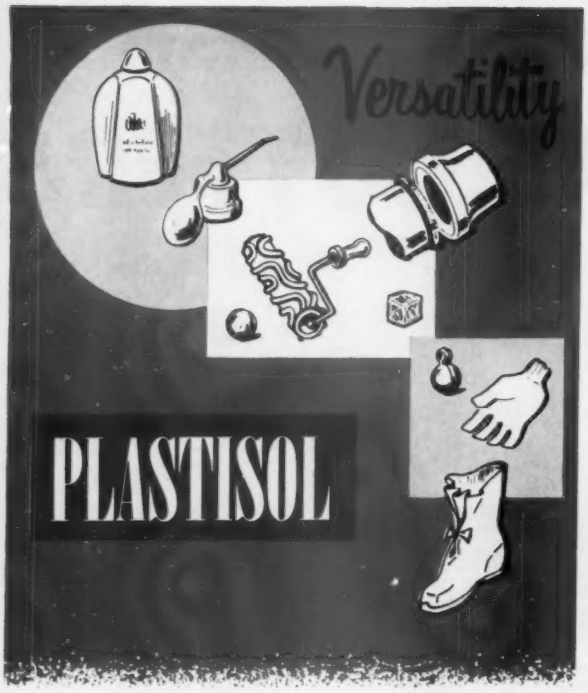
NATIONAL RUBBER MACHINERY COMPANY

NRM

General Offices and Engineering Laboratories, 47 West Exchange St., Akron 8, Ohio
East: 384 Getty Ave., Clifton, N. J.
West: S. M. Kipp, Box 441, Pasadena 18, Cal.
Export: Gillespie & Company, 96 Wall St., New York 6, N. Y.

ENCOURAGE OUR YOUTH To CONSIDER The OPPORTUNITIES In ENGINEERING and SCIENCE





The soft, rubber-like characteristics of plastisols lend themselves to many applications:

1. In the creation of a new product.
2. As an improved material for a current product.

The toughness, chemical resistance, wear resistance, tear strength and permanent flexibility make these compounds outstanding as noise deadeners, wire coatings, flexible molded parts, textile coatings, sealing compounds, glove coatings and in many other applications.

If your product requires a soft plastic coating or a molded part, you should consider the use of vinyl plastisols.

"Best Known Name In Plastisol"

Watson-Standard Co.

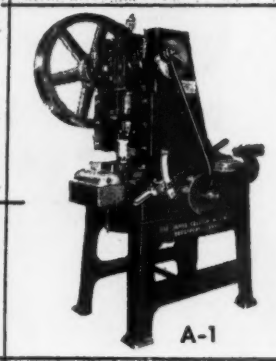
225 Galveston Ave., Pittsburgh 30, Pa.

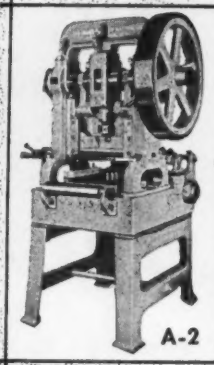
NEW YORK OFFICE: 15 Park Row, New York 38, N. Y.
CHICAGO OFFICE: 55 E. Washington Street, Chicago 2, Ill.

PLASTICS • INDUSTRIAL FINISHES • CHEMICALS

COULTER

THE KEY TO HIGHER QUALITY CUTTINGS



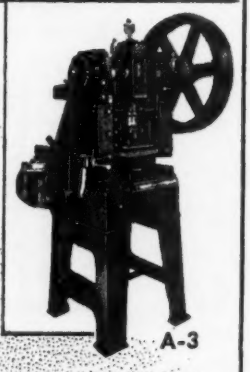


MODEL A-1
Cutting Heels at high speed production or short runs.

MODEL A-2
Cutting Multiple Heels, Half and Full Soles with stock grain.

MODEL A-2s
(Not illustrated)
Cutting across grain of stock.

MODEL A-3
Cutting Multiple Heels and Taps with or across stock grain.



Since 1896
coulter production machines
HAVE MEANT MORE IN HIGHER QUALITY CUTTINGS . . . MORE IN GREATER PRODUCTION.

the James COULTER Machine Co.
BRIDGEPORT, CONN.

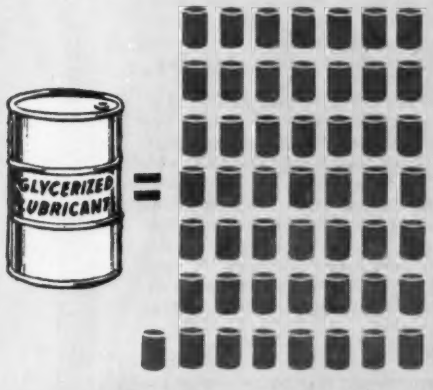
BRIDGEPORT · CONNECTICUT

NO PUZZLE!

when you use GLYCERIZED (LIQUID CONCENTRATE) LUBRICANT

ECONOMICAL?
Here's Why...

HIGHLY CONCENTRATED
1 drum makes up to 50 drums of working solution



Also Mfgrs. of

RUBBEROL AND SYNTHOL

TWO OTHER FACTORY PROVED RUBBER PROCESSING AGENTS

THE ALL PURPOSE EXTERNAL LUBRICANT

NATURAL SYNTHETIC AND RECLAIM STOCKS

DOES NOT INTERFERE WITH TACK OR KNIT

Prevents adhesion of hot rubber slabs when piled . . . banishes dust nuisance by replacing soapstone or talc . . . prevents sticking during cure of extrusions and flat pan coiled tubing . . . excellent release agent for molds, mandrels, air bags, belt drums . . . equally satisfactory for washing and finishing inner tubes; imparts satiny finish . . . greatly aids in the processing of insulated wire and cable. The Production Departments and Laboratories of many rubber manufacturers, through years of using GLYCERIZED, give ample proof of its outstanding qualities as a lubricant for natural, synthetic and reclaimed stocks.

QUALITY SINCE 1884

GENSEKE BROTHERS

RUBBER MATERIALS DIVISION

West 48th Place and Whipple Street **Chicago 32, U.S.A.**

HOGGSON TOOLS, MOLDS AND DIES
For Rubber Testing & Production

Shown here are but a few of the many types of rubber working equipment available. Please submit your problem.

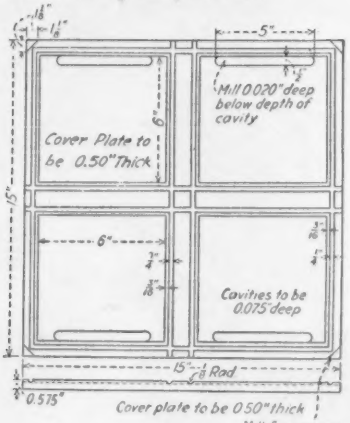
BENCH MARKER

1" and 2" Centers

SHOE STITCHER

PORCUPINE ROLLER

CONCAVE ROLLER


Mill 0.020" deep below depth of cavity
Cover Plate to be 0.50" Thick
Cavities to be 0.075" deep
Cover plate to be 0.50" thick
Mill four corners deep for prying mold apart

(Above)

Standard ASTM and Federal dies for cutting test tensile and tear strength samples, and dies for slab curing carried in stock. Write for catalog.

Pacific Coast: H. M. Royal, Inc., Los Angeles

HOGGSON & PETTIS MANUFACTURING CO. • 141A Brewery St. • NEW HAVEN 7, CONN.

The Toughest rubber industrial belting is made with RESORCINOL

Rubber conveyor belts, like this one carrying boulder-size chunks of coal, are subjected to the most brutal treatment imaginable. Plain rubber couldn't take it for long. But these conveyor belts are reinforced with powerful synthetic fibers — fibers which are *permanently bonded* to the rubber. Consequently they are able to take severe punishment for years.

Koppers resorcinol-formaldehyde resins form a lasting bond between synthetic reinforcing cords and rubber—a bond that will take constant pounding and wear, will withstand prolonged flexure in service, without separating. Their remarkable adhesive properties with rubber make Resorcinol-based resins ideal for use in the manufacture of heavy duty tires, belting, and in virtually all products where rubber is reinforced with synthetic or natural fibers.

For further information, write to:

Koppers Chemicals

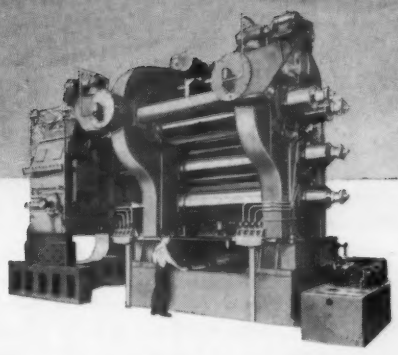
KOPPERS®

KOPPERS COMPANY, INC., Chemical Division, Dept. RA-35, Pittsburgh 19, Pennsylvania

SALES OFFICES: NEW YORK • BOSTON • PHILADELPHIA • ATLANTA • CHICAGO • DETROIT • LOS ANGELES

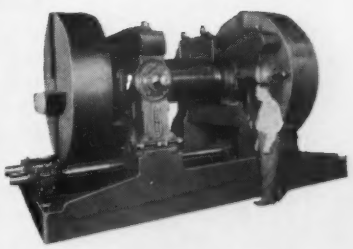
Memo

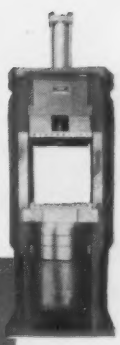
If your problem requires rubber or plastics processing "know-how," we can be of help



Our experienced and highly specialized engineering organization makes available to you the combined abilities of many minds for assistance in solving problems relating to machinery and processes for the manufacture of rubber or plastics products. Close cooperation with the rubber and plastics industries, and a consistently maintained research program, have enabled us to pioneer many revolutionary processes and improvements in basic manufacturing equipment.

When your plans call for the installation of single units or for the setting up of complete processing trains with all accessories, consult us. Designing processes and machinery to meet unusual product requirements has been our business for over 60 years.



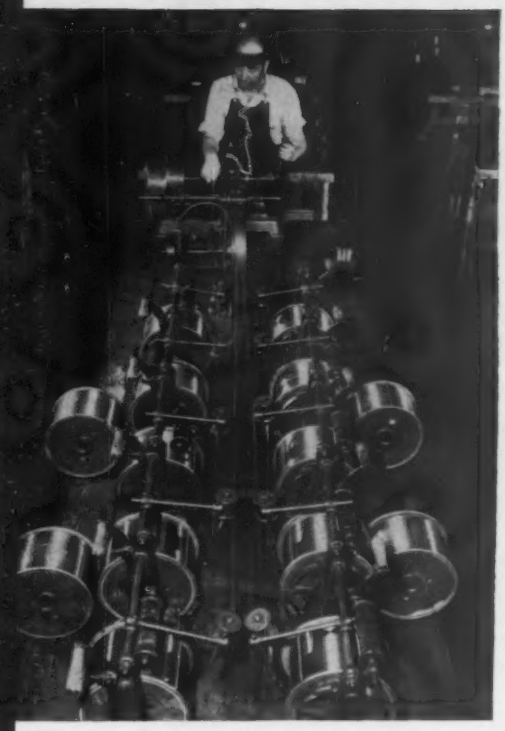


ADAMSON UNITED COMPANY

730 Carroll Street, Akron 4, Ohio

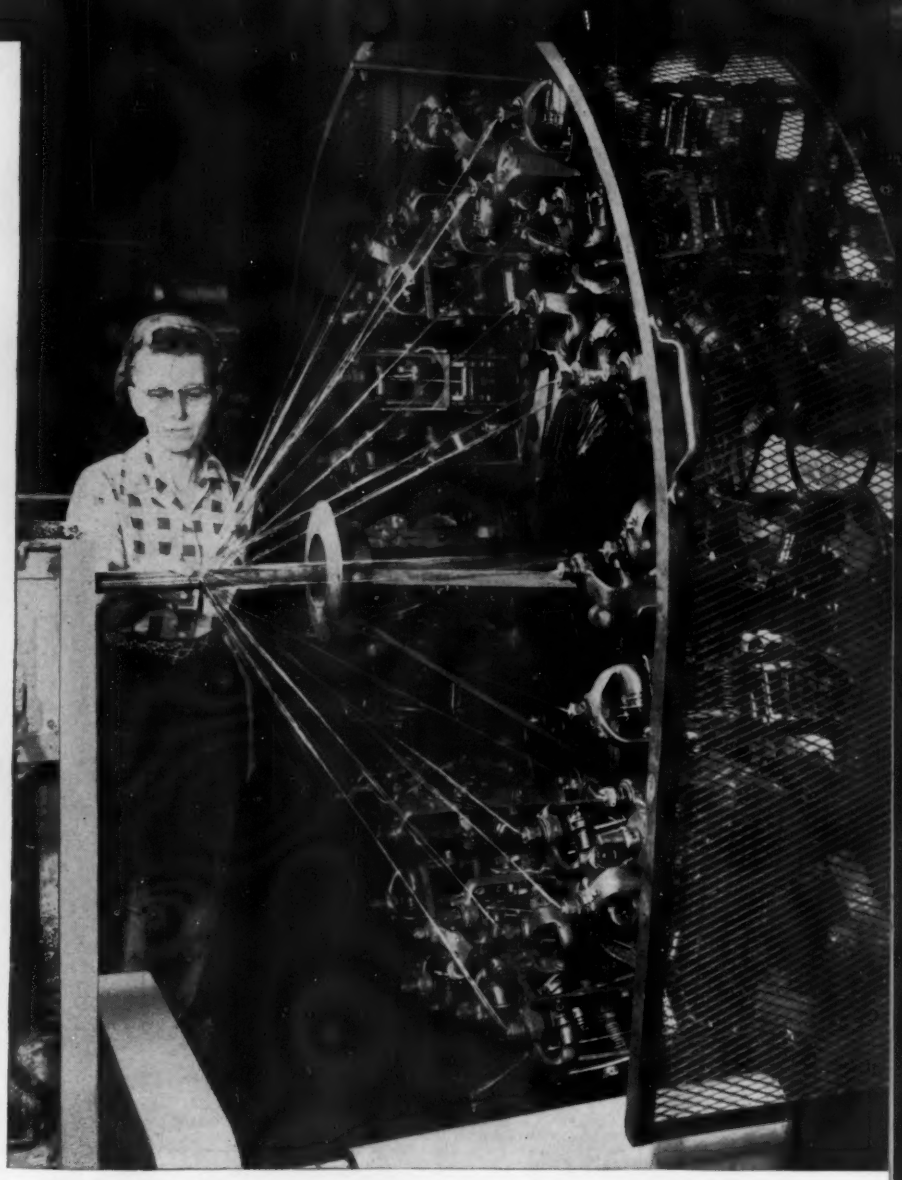
Branch Offices located in Principal Cities

Subsidiary of United Engineering and Foundry Company • Plants at Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington (Lobdell United Div.)



1. Fine Steel Wire furnished on 65 lb. spools, is rewound into multiple wire strands. It is extra straight for smooth spooling.

2. The Number of Wires in a multiple is determined by the design of the hose it is to reinforce. These wires have tensile strengths of up to 400,000 psi.



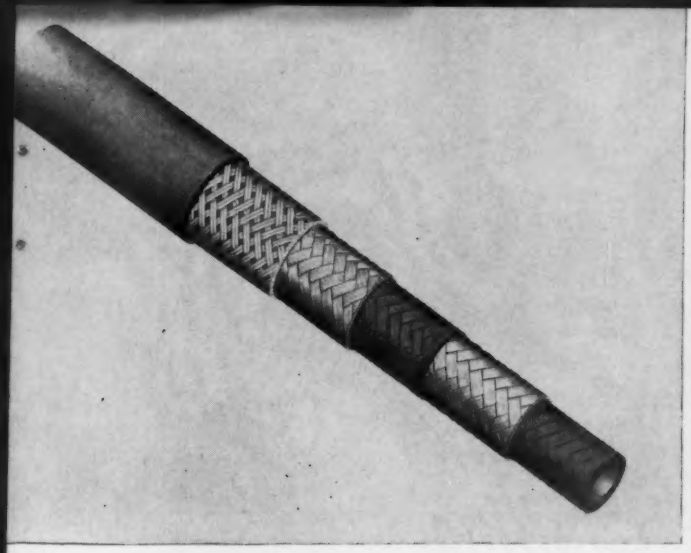
3. Multiple Strands are braided around the tube or core of the hose under constant tension in this planetary braider. Wires are uniformly sound to avoid breakage. Bright golden liquor finish on the wires makes the bonding cement applied later adhere to them.

How Fine Steel Threads Give Strength To Rubber Hose

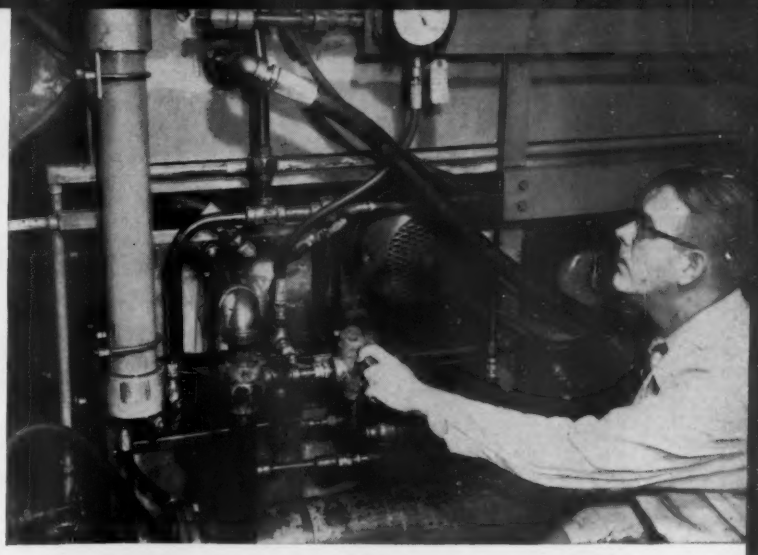
Concealed inside a rubber covered flexible hydraulic hose is the story of how special quality steel threads, woven into intricate sinews, help control and resist tremendous internal pressures.

Such hydraulic hose is used to transmit power on an ever-widening variety of machinery and equipment ranging from hydraulic presses, power feeds on machine tools, die sinking and forming presses, multiple die-casting equipment—to aircraft controls, farm and road building equipment, trucks—even the high-pressure greasing equipment in your neighborhood gas station.

B. F. Goodrich Company, for example, produces hundreds of miles of this hose every year in a variety of more than 150 types, and in a range of diameters and constructions that will carry working pressure up to 9,000 pounds per square inch.



4. Rubber-Covered hydraulic hose has an intricate inside construction. Braiding wire is sheathed in alternate layers of textile braid and rubber to prevent friction and maintain flexibility. When man-made rubber cement is added, it fills all the interstices, bonding and sealing the hose to contain tremendous pressures.



5. Uses of Hydraulic Hose are ever-increasing as they are a vital element in development of advanced machinery and automatic controls.

The ability of hydraulic hose to contain these enormous pressures comes from braids of fine steel wire woven into its construction. It is a special wire with tensile strengths ranging from 240,000 to 400,000 pounds per square inch such as that produced by Johnson Steel & Wire Company.

• **How It Is Made**—Watching low pressure (2,500 psi) hose produced at B. F. Goodrich, for example, you see Johnson wire arriving on spools. These spools are placed on rewinding machines (photo No. 1). The wires are rewound onto a spindle in flat strands that are several wires wide (photo No. 2), depending upon the design of the hose they are to reinforce.

Spools holding the strands are placed on planetary braiding machines (photo No. 3) that can hold from 16 to 64 spools. The number used depends upon the diameter and capacity of the hose.

As the braider revolves, the strands under constant controlled tension feed onto the basic fabric of the hose which moves through the center of the machine. Each hose is constructed of wire strands and textile braids insulated by rubber to cushion, bond, and support the wire braid—serves as an anti-friction agent and gives supple flexibility (photo No. 4).

Man-made rubber cement is added to bond and seal the construction, filling all the interstices between braids. Finally a rubber coating is applied to protect the steel and cotton fabric. It is tested at twice the recommended working pressure.

• **Strong Sinews**—Obviously the wire made by Johnson Steel & Wire for reinforcing hose is something out of the ordinary. It is drawn from selected high carbon steel in diameters ranging from .008″ to .016″ and has exceptional dimensional accuracy—a tolerance of plus or minus .0005″.

It is supplied with a special golden liquor finish which provides an adhering surface for the bonding cement. This wire is very straight to make possible even spooling and has uniform tensile strength to prevent it breaking under the working tension.

This wire helps assure smooth, economical operation of the precision process of reinforcing hose which is why such producers as B. F. Goodrich and other leaders know Johnson as a dependable source of supply for hose reinforcing wire and other special wires used in many of their products.

In fact, many industries draw upon Johnson's vast experience in producing a wide range of fine specialty wire for aircraft cord, armature binding, belt lacers, bobby pins, brushes, gutterbrooms, textile machinery, shade rollers, flexible shafts, mandolins, pianos, wire rope, safety pins, staples, metal stitching, tire beads, MB hard drawn and oil tempered spring wire and music spring wire.

These specialties are helping many manufacturers speed production, improve their products with economy. Perhaps you too can benefit. Call the nearest district office for prompt personal service.

Johnson Steel & Wire Company, Inc.

Worcester, Massachusetts

Everything New But the Name

***a subsidiary of* Pittsburgh Steel Company**

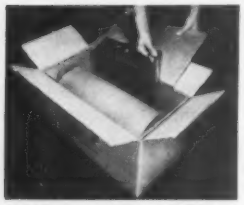
Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES: Akron • Atlanta • Chicago • Cleveland • Columbus • Dallas • Dayton • Detroit • Houston • Los Angeles New York • Philadelphia • Pittsburgh • San Francisco • Tulsa • Warren, Ohio. **PLANTS:** Monessen, Pa. • Allenport, Pa. Akron • Los Angeles • Unionville, Conn. • Warren, Ohio • Worcester, Mass.

New Patapar Releasing Parchments

Better release...lower cost

The new releasing types of Patapar Vegetable Parchment have characteristics which make them ideal as a protective backing for pressure sensitive surfaces, separator sheets for uncured rubber, rubber tape, and as a wrapping material for tacky substances.



Effective separator sheet for uncured, natural, or synthetic rubbers

Separator sheet for rubber tape — releases readily

Some of Patapar's advantages:

- Dense, fibre-free surfaces
- Excellent release from tacky surfaces
- Releasing qualities remain constant as time passes
- High resistance against penetration or migration of rubber softeners
- Pressure sensitive surfaces retain full effectiveness
- Low cost

Send for Samples — We'll gladly send you technical data together with samples of the various new types of Patapar Releasing Parchments.

Write today.

PATERSON PARCHMENT PAPER COMPANY
Bristol, Pennsylvania
West Coast Plant:
340 Bryant Street, San Francisco 7
Sales Offices: New York, Chicago

Patapar®
Vegetable Parchment
HI-WET-STRENGTH·GREASE-RESISTING

HEADQUARTERS FOR VEGETABLE PARCHMENT SINCE 1885

Smoother Sailing

WITH EEMCO RUBBER and PLASTICS PROCESSING MACHINERY

MILLS
CRACKERS
WASHERS
REFINERS
★ ★ ★
PRESSES
compression
transfer
fibre glass reinforced plastics
LABORATORY MILLS & PRESSES

EEMCO a leader in RUBBER and PLASTICS MACHINERY

If you are looking for answers to your rubber and plastics equipment problems, you will find them at EEMCO. Yes, they offer smoother sailing on many production problems with the machines which bear the EEMCO trademark. Skillfully designed by qualified engineers—and made by workmen with many years of experience—they offer the utmost in quality, design and workmanship. Serving manufacturers throughout the world, EEMCO rubber and plastics processing machines have proved their worth. EEMCO has its own Foundry, Machine Shop, and Engineering Department to insure fast delivery. Get prices and delivery dates from EEMCO where only the best has been built for many years.

EEMCO

ERIE ENGINE & MFG. CO.
Rubber & Plastics Machinery Division
12th St. & East Ave., Erie, Pa.

INTRODUCING *fine particle* DOW CORNING 36 EMULSION

with greater stability than other silicone mold release emulsions

Moe Muscles used to claim that with Dow Corning mold lubricants he could meet the production quota standing on his head. After trying the new *fine particle* Dow Corning 36 Emulsion, however, he's willing to go one better. That's because he and Inspector Mike have learned that this really new silicone mold release agent establishes a new high in performance. It's more resistant to creaming or separation due to heat, cold, centrifuging or high dilution than any other silicone emulsion ever developed. Unaffected by additives or metals, Dow Corning 36 will not break in the tank even when diluted 100 to 1 and allowed to stand as long as 3 days.

Fine particle size accounts for the greatly increased stability of Dow Corning 36 Emulsion. Average particle size is less than 0.5 microns or about 1/10 that of previous silicone emulsions. Equally important in many applications is the fact that fine particle size also results in a further improvement in surface finish.

Furthermore, the new *fine particle* Dow Corning 36 Emulsion is available at the same low price as the regular Dow Corning mold release emulsions. That adds up to easier release, better appearance and fewer rejects at production costs that are lower than you ever experienced before. For further information and a generous free trial sample, return the coupon TODAY!

DOW CORNING CORPORATION • Midland, Michigan • Dept. 9203

Please send me:

☐ *Technical data on Dow Corning 36 Emulsion*

☐ *Free sample of Dow Corning 36 Emulsion*

NAME_____

COMPANY_____

STREET_____

CITY_____ ZONE____ STATE_____

DOW CORNING SILICONES

first in silicone release agents

DOW CORNING CORPORATION

MIDLAND • MICHIGAN

ATLANTA • CHICAGO • CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEW YORK • WASHINGTON, D. C. (Silver Spring, Md.)

Canada: Dow Corning Silicones Ltd., Toronto; **England:** Midland Silicones Ltd., London; **France:** St. Gobain, Paris

Manufacturers of CANARY LINERS

Mildew-proofing *and* Flame-proofing Cotton Fabrics as per Government Specifications. *Write or Wire for Samples and Quotations.*

EXPORT AGENT
Binney & Smith, International, Inc.,
380 Madison Ave., New York 17, N. Y.

CANADIAN AGENT
Binney & Smith, Limited
33 Edward St., Toronto 3, Ontario, Canada

J. J. WHITE Products Co.
7000 UNION AVENUE
CLEVELAND 5 OHIO

VULCACURE*

AQUEOUS SUSPENSIONS OF ULTRA ACCELERATORS, BY A NEW PROCESS, FOR LATEX COMPOUNDING

VULCACURE ZM
50% Zinc Dimethyldithiocarbamate

VULCACURE ZE
50% Zinc Diethyldithiocarbamate

VULCACURE ZB
50% Zinc Dibutyldithiocarbamate

VULCACURE NB
47% Sodium Dibutyldithiocarbamate

PROVEN PRACTICAL AND ECONOMICAL

PARTICLE SIZE BETTER THAN FORTY-EIGHT HOUR BALL MILLED DISPERSIONS

•

Our sales and technical staffs are at your disposal

* Registered Trademark

NEW ENGLAND OFFICE:
Alco Oil & Chemical Corp.
610 Industrial Trust Building
Providence 3, R. I.

ALCO OIL & CHEMICAL CORP.
Trenton Ave. and William St., Philadelphia 34, Pa.

WEST COAST REPRESENTATIVE:
H. M. Royal, Inc.
Whse., 4814 Loma Vista Ave.
Los Angeles 58, Cal.

for new equipment, spares or replacements . . .

UNITED *Service-Proved* CRACKER ROLLS

THERE IS A
UNITED®
service-proved
ROLL

When you specify UNITED ROLLS, your complete satisfaction is guaranteed by over 50 years' experience in the design and manufacture of rolls for practically every type of rolling application. Precision engineered to the specific requirement of the individual machine or equipment in which they are to be used, UNITED *Service-Proved* ROLLS are in use the world over by processors of rubber, plastics, linoleum, paper, paint and scores of other metallic and non-metallic substances.

Specify UNITED ROLLS for new equipment, spares or replacements. The experience and advice of our rolls engineers is available without obligation.

FOR EVERY
- **RUBBER**
- **PLASTICS**
- **LINOLEUM**
- **TILE**
- **PAINT**
- **OR OTHER**

NON-METALLIC *PROCESSING REQUIREMENT*

UNITED ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at • Pittsburgh • Vandergrift • Youngstown • Canton • Wilmington (Lobdell United Division)
SUBSIDIARIES: Adamson United Company, Akron, Ohio
Stedman Foundry and Machine Company, Inc., Aurora, Indiana

Designers and Builders of Ferrous and Non-Ferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

3 *quality AROMEX grades to choose from!*

aromex HAF

—accepted as the leading standard throughout the world

aromex ISAF

—the extra quality black for added
tire treadwear, easy processing—
fast growing in popularity

aromex SAF

—a still finer particle size black.
Under study by leading tire manufacturers.
Write *now* for working samples.

J. M. Huber Corporation · 100 Park Avenue, New York 17

Manufacturers of Furnace Blacks
Channel Blacks
Rubber Clays
Rubber Chemicals

AROMEX HAF • AROMEX CF • AROMEX ISAF • AROMEX SAF • MODULEX (HMF)
WYEX (EPC) • ARROW TX (MPC) • ESSEX (SRF) • AROVEL (FEF) • COLLOCARBS

HUBER

RUBBER AGE

One of the World's Outstanding Rubber Journals

NUMBER 6
VOLUME 76

M. E. LERNER
Editor

B. J. KOTSHER
Associate Editor

KENNETH T. CORELL
Production Manager

ELLA MAY DARRIN
Circulation Manager

CHARLES T. JANSEN
Advertising Manager

PETER P. PINTO
General Manager

CONTENTS FOR MARCH, 1955

Artificial Weathering of Rubber: The Ozone Factor in Weathering and a Technique for Generation and Control of an Ozonized Atmosphere—*By Dale J. Milnes* 875

Compounding Silicone Rubber—*By P. C. Servais* 879

Quality Control of Vinyl and Polyethylene Electrical Insulating and Jacketing Materials—*By R. C. Boyd* 882

Engineering Developments of Rubber: July, 1953-August, 1954—*By Lillian Sutter and Leora E. Straka* 885

Firestone Handling System Uses Conveying Car for Weighing 892

How Firestone Minimizes Carbonization of Equipment in Its Pottstown Tire Plant—*By R. F. Repenning* 893

●

REGULAR DEPARTMENTS

Book Reviews	940	Los Angeles News	924
Canadian News	926	Names in the News	916
Chemical Prices	*	New Equipment	934
Classified Ads	957	New Goods	930
Coming Events	906	Obituaries	928
Editorials	895	Rubber, Cotton Markets	944
Financial News	920	Statistics	948

* Appears every other month

●

Published on the 15th of each month by

PALMERTON PUBLISHING COMPANY, INC.

Printing Office,
East Stroudsburg, Pa.

Editorial and Advertising Offices,
250 West 57th St., New York 19, N. Y.

New England Representative—F. ROYAL CAREY, P.O. Box 133, Providence, R.I.

Midwestern Representative—LARRY M. LYONS, 549 West Washington St., Chicago 6, Ill. Phone: Central 6-0545.

News Correspondents—CARL S. HOGLUND, 5107 Telegraph Road, Los Angeles 22, Calif.—Phone: ANgelus 2-0117. PHIL GLANZER, 223 Coldstream Ave., Toronto 12, Canada.

Entered as Second Class Matter, October 20, 1933, at the Post Office at East Stroudsburg, Pa., under Act of March 3, 1879. Subscription Rates: Domestic, $5.00 a year; Canada, $5.50; Foreign, $6.00. Single copies up to 3 months old, 50 cents; over 3 months old, 75 cents. Telephones: COlumbus 5-2923, 5-2924. Contents Copyrighted 1955 by the Palmerton Publishing Company, Inc. Indexed in Industrial Arts Index and Engineering Index. OFFICERS: P. L. Palmerton, President; E. D. Osborn, Vice-President and Secretary; Peter P. Pinto, Treasurer.

MICROFILMS

Microfilm copies of complete volumes of RUBBER AGE are available from University Microfilms, 313 N. First St., Ann Arbor, Mich.

Also Publishers of:

RUBBER RED BOOK
Directory of the Rubber Industry
Published Biennially

ANNUAL BIBLIOGRAPHY OF RUBBER LITERATURE
Compiled by D. E. Cable, Ph.D.
For Years 1935-1939

LATEX IN INDUSTRY
By Royce J. Noble, Ph.D.
Text Book on Latex

LATEX AND ITS INDUSTRIAL APPLICATIONS (Vol. I)
(Out of Print)
By Frederick Marchionna
Bibliography of latex patents and literature to June, 1932.

LATEX AND RUBBER DERIVATIVES AND THEIR INDUSTRIAL APPLICATIONS (Vols. II & III)
By Frederick Marchionna
Bibliography of latex patents and literature from June, 1932, to January, 1937; rubber derivatives to January, 1937.

Where Flexibility is vital

FLEXAMINE has no equal!

This superior antioxidant and flex-cracking inhibitor gives transmission, conveyor, and V-belts the *finest possible protection* against cracking, fatigue, and consequent premature failure.

In addition, Flexamine provides outstanding resistance to heat, copper and manganese, and static weather cracking.

Developed by the world's leader in rubber chemicals, Flexamine has proved its effectiveness in such products as tires, mechanical goods, cable jackets and insulation, molded soles, and linesman's gloves and aprons.

A brown powder with a specific gravity of 1.19, Flexamine has good storage stability—melts at 75-90°C—and disperses readily. It requires no handling precautions and is slightly activating. Though usually 1 part per 100 is used, Flexamine is still remarkably effective in amounts as low as 0.2 per 100.

If *lasting* flexibility belongs in *your* product, Flexamine does. Better find out more by writing on your letterhead to the address below. Why not do it *now?*

Naugatuck Chemical

Division of United States Rubber Company
Naugatuck, Connecticut

BRANCHES: Akron • Boston • Charlotte • Chicago • Los Angeles • Memphis • New York • Philadelphia • **IN CANADA:** Naugatuck Chemicals, Elmira, Ontario
Rubber Chemicals • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latices • Cable Address: Rubexport, N.Y.

RUBBER AGE

Vol. 76, No. 6 MARCH, 1955

Artificial Weathering of Rubber

The Ozone Factor in Weathering and a Technique for Generation and Control of an Ozonized Atmosphere

By DALE J. MILNES

Senior Project Engineer, Mast Development Co., Inc., Davenport, Iowa

IT has been recognized since earliest time that most organic substances upon exposure to weather suffer depreciating alterations in their physical characteristics ranging from simple fading, cracking, and crazing to complete and permanent loss of tensile strength. It has only been in the last quarter of this century that serious and scientific investigations have been pursued to determine and assign the precise causative factors. Prior to this period, all factors were bunched together into a single conglomerate and the process was termed "weathering."

The ancients, as indicated in the writing of both Herodotus and Aristotle, assigned to weather those constituents which have since been generally acknowledged and accepted, namely, air, light, heat, and moisture. But with advancements in the sciences, notably chemistry and physics, the components air and light have been further subdivided into a legion of components, each having its own peculiar effects and each a sensible factor to be reckoned with in any scientific analysis of the effects of weathering. Early investigators, lacking certain knowledge of the many constituents of weather, prepared many scholarly misassignments of causation which have since influenced both popular thinking and industrial processing. In the case of rubber deterioration, these influences have not been entirely unfelt.

Air, as it exists at the earth's surface, is now known to consist of a mixture of the following constituents: *Major*—nitrogen and oxygen; *Minor*—carbon dioxide, argon, helium, neon, krypton, and xenon; *Trace*—ozone, nitrogen oxides, ammonia, sulfur dioxide, sulfuric acid, hydrogen sulfide, carbon monoxide, hydrocarbons, hydrogen, mineral salts, hydrogen peroxide, and organic peroxides. Of the many constituents, only oxygen, ozone, and nitrogen oxides are capable of reacting with rubber, and of the latter three considerable experimentation has demonstrated that only oxygen and ozone produce any perceptible effect in the concentrations which are present.

Role Played by Ozone

Ozone was discovered by Schonbein in 1840. It is an allotropic form of oxygen containing three atoms in the molecule (O_3). It is a very unstable and powerful oxidizing agent, considerably more active than oxygen (O_2). It was early discovered that its presence could be induced by passing an electric arc through air and

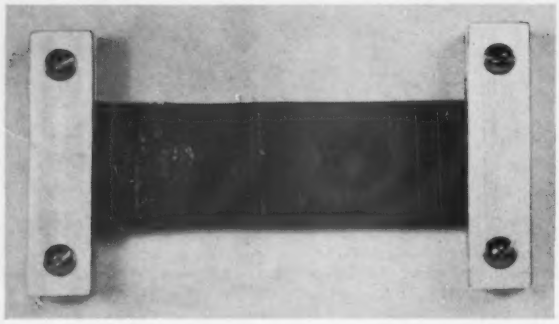


FIG. 1—Typical example of the weather cracking of rubber.

that it could be detected by its peculiar and immediate effect upon potassium iodide, liberating free iodine.

Although spectroscopic determinations indicated that ozone was present in but minute quantities in the atmosphere, and despite the fact that many attempts at measurement were conducted, it was not until 100 years after the discovery of ozone that the first dependable measurements of ozone concentration in the atmosphere were made by Edgar and Paneth in 1940 *(1)*. Their conclusion that the normal concentration of ozone in the atmosphere near the surface of the earth is 4 to 6 parts per hundred million (pphm) was substantiated in 1946 by the similar scientific measurements and observations of Crabtree and Kemp *(2)*.

Although all industries whose products are more or less continuously exposed to weathering are critically concerned with the decay and depreciation of their products as a function of time in atmosphere, the rubber industry, continually attempting to produce better products at consumer's prices, for a number of years has been engaged in research to determine the cause or causes of the special effect apparent as crazing or cracking of rubber products upón exposure to weather. Figure 1 is a photograph of a rubber sample exhibiting weather cracking. The pronounced feature is that the cracking occurs at right angles to the direction of rubber stretch and is accompanied by proportionate loss in tensile strength, ultimately culminating in rupture of the sample.

Preliminary investigations into the relative roles of temperature, humidity, light, and air as factors in the crazing of rubber revealed a correlation between light and this special effect *(3, 4)*. These observations were further refined into the recognition that the ultra-violet component of light was the prime factor. Later studies *(2, 5, 6)* initiated a further departure from the earlier view and established proof that a product of ultra-violet radiation in air (namely, ozone) is the outstanding causative factor, and that the subsidiary factors temperature, humidity, and light could, to some extent, influence the rate of attack.

Cause of Atmosphere Ozone

The theory is now accepted and validly substantiated that the significant cause of atmosphere ozone is a photochemical action of ultra-violet light upon oxygen in the stratosphere *(7-11)*. Ozone ultimately is carried down to the surface of the earth by convection currents, and as a matter of fact, no ozone at all is formed in this manner by ultra-violet light at the surface of the earth, since light of the necessary wave lengths is completely absorbed before reaching the lower atmosphere. However, present studies by Stanford University, in relation to the Los Angeles smog problem, indicate that light may have a catalytic effect in the presence of gaseous organics to form ozone. Light of the longer wave lengths, which exists at the earth's surface, breaks down the ozone and returns it to the oxygen state.

The totality may be considered a continuous cycle, the equilibrium of which is considerably influenced by the reactance of ozone in almost complete promiscuity with every organic substance and most inorganic substances. In evidence of its instability, in many cases where ozone does not react with a substance, it nevertheless will allow itself to be reacted upon to be reduced, by catalysis, to oxygen. The net effect is that the total ozone concentration in the atmosphere is essentially constant, 4 to 6 pphm, but varying with topography, latitude, season, and industrial activity. Its average concentration is highest in the summer and lowest in the winter, the concentration tending to be inversely proportional to distance from the equator.

Having established the fact that ozone is the major cause in the crazing of rubber, the next step was to devise a laboratory system for the production and control of ozone, i.e., an ozone generator and concentration control. It is, of course, apparent that little experimental progress could be achieved if each experiment required the passage of several months of natural weathering before all of the results could be perceived and analyzed. Such a program would take years, and the variables would be quite difficult, perhaps impossible, to control. Therefore, the need became immediate for the development of an artificial means of ozone production and control.

The basic chemical principle for a system of ozone control was discovered accidentally by Faulk and Bawden *(7)* in 1926. In preparing for the titration of

FIG 2—Over-all view of the MDC ozone test chamber.

iodine in what was then the conventional manner, it was discovered that iodine may be titrated by a thiosulfate solution in an apparatus that consists of a pair of electrodes across which there is a potential difference of 10 to 15 millivolts. In the presence of free iodine, it was observed, current will flow, diminishing in value as the concentration of iodine diminishes, the latter due to the back electromotive force of polarization, a consequence of complex ionization effects at both anode and cathode. Willard and Fenwick have exhaustively developed the theory of the behavior of gasses at metallic electrodes. Experimental laboratory equipment exploiting this basic principle has been set up by only a few researchers, and these beginnings have only occured since World War II.

The Mast Ozone Test Chamber

In 1952, the Department of the Army, Ordnance Corps, commissioned the Mast Development Company to build an ozone production and control apparatus for experimental study of ozone effects upon rubber and rubberlike materials based upon a design developed by the Firestone Tire & Rubber Company in conjunction with the Rock Island Arsenal Rubber Research Laboratory. This device was built and was subsequently installed at the Rock Island Arsenal. In 1953, the Department of the Navy, Bureau of Ships, commissioned Mast Development further to develop the ozone production and control device in behalf of Naval research into the artificial aging of natural and synthetic rubber products. This device, termed Ozone Test Chamber, Model 644-2, has been delivered to the Rubber Laboratory at the Mare Island Naval Shipyard. Because of the impetus promised research by the present commercial availability of an ozone test chamber, it is believed that a new era in protection of rubber from weathering may well be at hand.

A view of the new ozone test chamber is seen in Figure 2. Essentially, the device consists of a chamber in which ozonizing is accomplished, an apparatus for the production and control of ozone, a mechanical system for flexing and stretching samples, and ductwork, temperature and vacuum controls.

Figure 3 is a schematic of the ozone production and control apparatus. As previously indicated, the apparatus utilizes a special application of the principle of the titration of iodine liberated from a potassium iodide solution by the continuous flow of ozonized air. In the instant case, variations in the conductivity of the solution control the operating cycle of ozone generating ultra-violet lamps and this conductivity is in turn determined by the rate of injection and the normality of a solution of potassium thiosulfate.

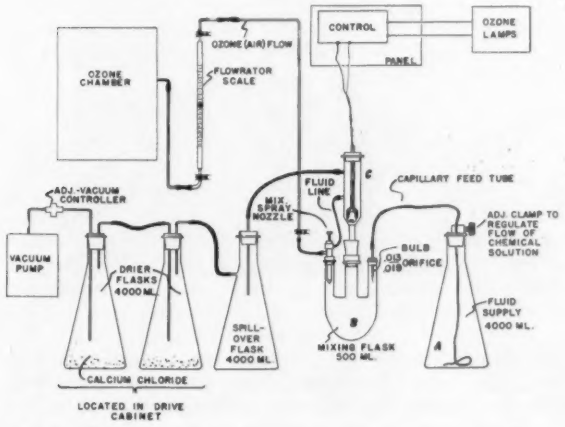


FIG. 3—Schematic diagram of the ozone production and control apparatus.

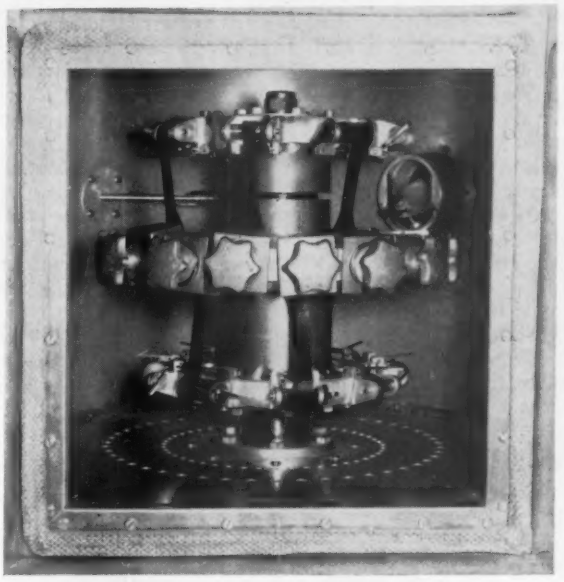


FIG. 4—Close-up of the ozone chamber showing the two tier sample-holding and flexing apparatus.

Flask A contains a solution of potassium iodide and sodium thiosulfate, the latter of a selected normality which is calculated to produce the desired ozone concentration. Both ozone and the titrating solution are drawn by a vacuum pump into the mixing flask B and thence to electrode flask C. In flask C there are the two platinum electrodes which are connected to a relay which determines the operation of a battery of ultra-violet lamps. So long as the current flow across the electrodes is less than 5 microamps at 15 millivolts the ultra-violet lamps continue to generate ozone. As the iodine content increases, and the current increases, the output of ozone is diminished and ultimately a state of equilibrium is attained, the value of which, to reiterate, is a function of the normality and rate of injection of the iodine neutralizing sodium thiosulfate.

In practice, the control maintains ozone concentrations at desired values within a probable error of 2% at 2000 pphm. The attainable range of ozone concentration can vary from as low as one part of ozone per hundred million parts of air to 10,000 parts of ozone per hundred million parts of air.

To protect the vacuum pump the neutralized solution is withdrawn through calcium chloride dessicant flasks which remove the liquid portion, and the air is then exhausted to atmosphere.

Figure 4 is a view of the ozone chamber within which is the Dynamat, a two tier sample-holding and flexing apparatus. As experimentation has established that ozone reacts with both synthetic and natural rubbers at rates which are a function of elongation (Ford and Cooper reported that cracking was never observed unless the rubber was under stress, and these findings are both substantiated and explained by Crabtree and Kemp), the MDC device includes this compact mechanical unit which provides for controlled stretching

and flexing of rubber samples. A total of eight samples can be mounted in each tier. Samples in the lower tier are mounted and maintained at a static stretch during the experimental cycle, whereas samples in the upper tier are subjected to dynamic exercising during the same cycle.

Both the extent (throw) and frequency (rate) of flexing is variable and controlled. Frequency may be established at anywhere from 50 to 250 cycles per minute, and the throw is adjustable up to 1¼-inches. Further, and in conjunction with these motions, the Dynamat unit is continuously rotated in the ozone chamber at selected rates from 1 to 6 r.p.m. It is anticipated that the Dynamat will be modified for varied applications and products, and the basic design was established with this expectation in mind. Temperature regulation from ambient to 200°F. is provided.

Potential for the Future

The applications for an ozone chamber, especially in the rubber, textile, petroleum, and other industries which employ organic base substances, are indeed numerous, and the development of an apparatus of the nature described promises to add considerably to the knowledge of the effects of ozone upon basic products. Both the Departments of Army and Navy have test schedules drawn up for months in advance and it is anticipated that industrial experimentation will keep apace. Already much effort is being expended on the comparative evaluation of various rubber compounds and the competitive products on the market.

Under the heading of protection of products from ozonizing are current experimentations into the protections offered by various waxes and varnishes in the preparation of rubber products, and the resultant variations in effects afforded as a consequence of the selection of different mineral loadings, softeners, petrolatums, etc.

A new respect has been accorded the ever present and pernicious allotrope ozone, the totality of which in the atmosphere would only produce a single layer 1 to 4 millimeters thick at the earth's surface. But the time may not be too far distant when tires, wire insulations, cording, and other rubber products, as well as paints, fabrics, and yet other organic base products, will be completely immunized to the destructive attacks of ozone in the atmosphere. American industry is leading the way.

ACKNOWLEDGMENT

The author wishes to thank the Mast Development Company for permission to publish this article, and Professor E. R. Erickson, research consultant to the company, and R. F. Shaw, of the Rock Island Arsenal, for their technical assistance.

LITERATURE REFERENCES

(1) Edgar, J. L., and Paneth, F. A., "The Determination of Ozone and Nitrogen Dioxide in the Atmosphere," *J. Chem. Soc.*, Vol. 144, p. 519 (1941).

(2) Crabtree, J., and Kemp, A. R., "Weathering of Soft Vulcanized Rubber," *Ind. Eng. Chem.*, Vol. 38, pp. 278-96 (1946); repr. in *Rubber Chem. Tech.*, Vol. 19, pp. 712-52 (1946).

(3) Tener, R. F., Smith, W. H., and Holt, W. L., "Aging of Soft Rubber Goods," Technical Paper No. 342, National Bureau of Standards, Washington, D. C. (1927).

(4) Newton, R. G., "Mechanism of Exposure Cracking of Rubber," *J. Rubber Research*, Vol. 14, pp. 27-39, 41-62 (1945); repr. in *Rubber Chem. Tech.*, Vol. 18, pp. 504-56 (1945).

(5) Ford, Earl W., and Cooper, L. V., "A Study of the Factors Affecting the Weathering of Rubberlike Materials," *I. R. W.*, Vol. 124, pp. 696-98, 701 (1951); Vol. 125, pp. 55-60 (1951).

(6) Blake, J. R., "The Effect of Light and Ozone on Rubber," Special Technical Publication No. 89, American Society for Testing Materials, Philadelphia, Penna. (1949).

(7) Foulk, C. W., and Bawden, A. T., "A New Type of End-Point in Electrometric Titration and Its Application to Iodimetry," Department of Chemistry, Ohio State University (August, 1926).

(8) Bogaty, H., Campbell, K. S., and Appel, W. D., "The Oxidation of Cellulose by Ozone in Small Concentrations," *Textile Research J.*, February, 1952.

(9) Gluckhauf, E., Heal, H. G., Martin, G. R., and Paneth, F. A., "A Method for the Continuous Measurement of the Local Concentration of Atmospheric Ozone," *J. Chem. Soc.*, September, 1943.

(10) Stair, R., Bagg, T. C., and Johnston, R. G., "Continuous Measurement of Atmospheric Ozone by an Automatic Photoelectric Method," *J. Research Nat. Bur. Standards*, Vol. 52, No. 3 (1954).

(11) Shaw, R. F., Ossefort, Z. T., and Touhey, W. J., "Antiozodants for GR-S Rubber," *R. W.*, Vol. 130, pp. 636-42 (1954).

The Fracton, a new instrument for fast, accurate **analysis of light hydrocarbon gases** by adsorption fractionation, has been introduced by the Burrell Corp., of Pittsburgh, Penna. A feature claimed for the new instrument is its high speed of analysis, said to be two or three times faster than any previous methods. Typical applications include synthetic rubber intermediates.

Foxboro Co., of Foxboro, Mass., has developed a new **general purpose ink** for use with the company's complete line of industrial recording instruments. Designated as Type 1500 Ink, it was especially formulated for use with Foxboro pens and Humitex charts to produce the sharpest possible record of a process variable. It is smooth flowing, will not clog the pen, and dries quickly without feathering the chart.

An entirely new type of **sanding machine** featuring dual action has been developed by the Detroit Surfacing Machine Co., Detroit 20, Mich. Called the Model D. A. Dual Action Sander, its sanding action moves in two directions at the same time, turning 6000 rpm's to the right and moving in a fast reverse action to the left. The dual action is said to result in much faster cutting and important savings in abrasives (sand) paper.

Vaporite Industrial White Ink is the name of a new **white ink for industrial use** developed by Time Saving Specialties, 2816 Dupont Ave. South, Minneapolis, Minn. The new ink writes on and adheres to an almost limitless range of surfaces, including rubber, cellophane, tile and wood. It is said to be fast drying, impervious to light, and unaffected by oil, grease or moisture. A special pen for the ink has also been devised.

Fisher Scientific Co., Pittsburgh, Penna., is now marketing reagent chemicals in its new **Gram-Pac**, described as tough laminated packages that eliminate the traditional quarter-pound glass bottles. The Gram-Pac is a triply-laminated, chemically-resistant disposable envelope.

Compounding Silicone Rubber

By P. C. SERVAIS

Dow Corning Corporation, Midland, Michigan

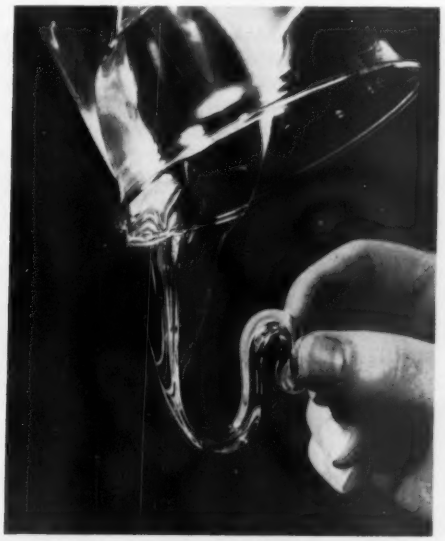
SILICONE rubber was first offered commercially ten years ago. In spite of its relatively high price and poor physical strength, many uses were soon found for this exceptionally heat-stable rubber with its low temperature flexibility, high resistance to ozone, corona, weather and to a variety of hot oils, its good electrical properties and non-adhesiveness to organic materials.

During the past ten years improvements have gradually been made in uniformity, in physical strength, in heat stability and low temperature flexibility, in electrical properties and in ease of fabrication. Stocks are available that are very uniform, allowing large scale industrial fabrication. Physical strengths as high as 1800 pounds tensile and 700% elongation are obtainable with stocks now produced in commercial quantities. Test samples that are flexible at −110°F. are still rubbery after 1000 hours at 480°F. Electrical properties and resistance to water are vastly superior now that fine, pure silicas are being used for fillers. Stocks of lower specific gravity and lower price are now available. There is still room for improvement, however, in such characteristics as solvent resistance.

Silicone rubbers are composed of four ingredients: polymers, fillers, additives and vulcanizing agents. Variations in the type and amount of these four ingredients produce silicone rubbers with a wide range of properties. Compounding techniques are developing rapidly as new and improved versions of these ingredients are developed, studied and incorporated.

In compounding silicone rubber, part of the filler is dispersed in the polymer by means of a heavy-duty mixer prior to milling.

Note: This article is based upon talks given by the author and other members of the Dow Corning technical staff before various local rubber groups.



Most silicone rubber is based on a crystal clear, linear dimethylsiloxane polymer with a molecular weight of about 400,000. This basic polymer is modified by the incorporation of phenyl groups to improve low temperature performance or by vinyl groups to make sulfur vulcanization possible.

Silicone Rubber Polymers

The polymer determines to a great extent the handling characteristics, the thermal stability and the low temperature behavior, as well as the corona, ozone and weather resistance, the adhesiveness to organic materials, the solvent and oil resistance and the vulcanizing ability of the compound.

Most silicone rubber is based on a linear dimethylsiloxane polymer of about 400,000 molecular weight. This remarkably heat-stable polymer is used to make silicone rubbers for molding, calendering and extruding. When properly compounded, fabricated and cured it yields rubber products that are stable at 480°F. If lower molecular weight polymers are used, lower physical strengths result. Too high a molecular weight makes the polymer so stiff that it is difficult to incorporate fillers and vulcanizing agents.

We have improved the low temperature utility of silicone rubber by a slight modification of the dimethyl silicone polymer. Attaching an occasional bulky organic group such as phenyl to the silicon atom in place of a methyl group keeps the rubber flexible at very low temperatures. Brittle points as low as −180°F. have been measured. Since this phenyl group is chemically attached to the polymer chain, its presence does not harm

Prior to shipment, the milled silicone rubber is extruded through a fine mesh screen to exclude any foreign particles.

high temperature stability. The same rubber that is flexible below −110°F. is resistant to temperatures of 480°F. Long exposure to corona, ozone and weather causes very little change in silicone rubber made with either the dimethyl or the phenyl modified dimethyl silicone polymer.

Silicone rubber-covered processing rolls are used in coating applications and in heat sealing plastic foils because sticky materials including hot organic plastics and rubbers do not stick to a silicone rubber surface.

Resistance to solvents varies with the nature of the solvent. The oxygen-containing solvents of low molecular weight such as the lower alcohols, ketones and glycols have very little effect on silicone rubber. The aliphatic, aromatic and chlorinated solvents cause excessive swelling.

Oil resistance also varies with the composition of the oil. Silicone rubbers are satisfactory for use in contact with the aliphatic oils at temperatures as high as the oil will withstand. Many industrial uses for silicone rubber are based on the retention of rubbery properties in contact with aliphatic oils at temperatures as high as 350°F. Aromatic oils, however, cause excessive swelling of silicone rubber. In ASTM No. 3 oil, at 350°F., silicone rubber swells about 50%. Research work is underway to make silicone rubbers that are more resistant to this type of oil.

Polymers that are quite different from the straight dimethylsiloxane in their vulcanizing behavior have recently been made available. These polymers can be vulcanized with sulfur or sulfur-containing vulcanizing agents. This is made possible by the introduction of a few vinyl groups into the dimethylsiloxane polymer.

Fillers for Stocks

The electrical and physical properties of silicone rubber are determined to a large extent by the type and by the amount of filler used in compounding. By filler variations, the following properties can be controlled:

Color	Dielectric properties
Specific gravity	Compression set
Elongation	Expansion coefficient
Tensile strength	Moisture resistance
Durometer	Chemical resistance
Tear strength	Thermal conductivity

Many hundreds of fillers and combinations of fillers have been investigated. Only a few of these have proved to be useful. Those properties that are important in a filler for silicone rubber are heat stability, fine particle size, chemical inertness toward the polymer and vulcanizing agents, and good electrical behavior at high and low temperature and on exposure to water.

Certain inorganic fillers meet most of these requirements. Titanium dioxide, zinc oxide, calcium carbonate, ferric oxide and silicon dioxide are all suitable. These fillers and silica in the form of diatomaceous earth, however, are not highly reinforcing in silicone rubber. Stocks made from these fillers have electrical properties that are fair to good, water resistance is poor to good and heat stability is fair to good.

In a peroxide vulcanizing system, pure fine silicas contribute the best properties to silicone rubber. They impart high tensile strength and elongation, high tear strength, good weather resistance and electrical properties. Low weight loadings in the range of 25 to 50 parts are adequate.

We have found four grades of fine silica to be satisfactory. Santocel CS, Aerosil, DuPont Fine Silica and Hi-Sil 303 all make high strength silicone rubber. Heat stability varies from 300° to 480°F. depending on what filler is used. Water absorption and electrical resistance are also dependent upon the purity of the silica filler.

Use of Additives

Additives are used to control color, to lower compression set and to improve heat stability. Heat stability of stocks made with the fine silicas can be improved by adding a small amount of iron oxide. We find the metal oxide pigments to be the best coloring agents. Nickel, chromium, iron, cadmium and titanium oxides have been used. These pigments have good color and good heat stability and they are inert to the polymer-vulcanizing agent. We recommend that they be checked before use and used in small quantities.

Low compression set additives are cadmium and mercury oxides. These oxides are toxic and must be handled with care. Stocks containing these additives should not be used in contact with food or drugs. Some care must be used in compounding and oven curing because of the nature of the additives.

The improvement in compression set accomplished by such additives is quite marked. Normally a silica-filled silicone rubber that shows 60 to 100% compression set at 300°F. will have a compression set of 15 to 25% if the proper amount of either one of these additives is incorporated.

Use of Vulcanizing Agents

Normally, silicone rubbers are vulcanized by the action of strong organic peroxides on the methyl groups of the polymer. Benzoyl peroxide, di-chlorobenzoyl peroxide and tertiary butyl perbenzoate have all been used. The organic peroxides, when heated to their decomposition point, produce free radicals which react with the methyl groups on adjacent polymer chains to cause cross-linking. The result is vulcanization and the development of rubberiness. This vulcanization occurs quickly in five to ten minutes at 230° to 300°F.

Since the free radicals are very reactive and dimethyl silicone is very unreactive, this cross-linking occurs only if no other reactive material is available. Therefore, such materials as carbon black, organic rubber, solvents, organic oil and sulfur must all be excluded to permit vulcanization through the decomposition of the organic

peroxide. Otherwise, these more reactive materials will dissipate the organic peroxide without causing vulcanization of the silicone rubber.

Compounding Techniques

The silicone rubber polymer requires no breakdown. The compounding ingredients can be incorporated in mixers or on conventional two-roll rubber mills. In milling silicone rubber, the compound bands on the fast roll and is most conveniently removed with a scraper blade. We prefer nylon to steel blades. They are more flexible, show less wear and reduce the possibility of introducing metallic particles into the silicone rubber. Ingredients are added in this order: polymer first, then filler, additives and finally vulcanizing agents. Milling must be done at temperatures low enough to prevent premature vulcanization.

We suggest that more than one mill-load batches of silicone rubber be cross-blended to insure uniformity. The final step in compounding should be to put the stock through a rubber strainer to remove foreign materials.

Compounding with Dow Corning 410 Gum

Sulfur is an effective vulcanizing agent for organic rubbers because of unsaturation in the rubber polymer. Unsaturation in the form of vinyl groups in the silicone polymer makes it possible to vulcanize silicone rubber with sulfur and sulfur-containing vulcanizing agents. Dow Corning has recently offered in commercial quantities such a polymer designated as Dow Corning 410 Gum. It is a dimethyl siloxane containing a few vinyl groups. It is clear and colorless with a specific gravity of 0.98 and a molecular weight of about 400,000.

When compounded with a fine silica, the new polymer will produce silicone rubber parts with a durometer of 60, tensile of 850 psi and elongation of 325%. Parts are stable at temperatures up to 400°F. with a brittle point of −80°F. The gum can be reinforced with carbon black or fine silica. It can be blended and covulcanized with such organic rubbers as natural, nitrile, Butyl, GR-S, neoprene and polyacrylate.

Blended with organic rubber, this new silicone rubber gum enhances heat stability, corona, weather and ozone resistance and low temperature flexibility. Physical properties depend on the amount of silicone polymer used, with tensile strength ranging from 2400 psi for a straight Butyl stock to 1940 for 90% Butyl-10% silicone gum and 1700 psi for a blend containing 25% silicone. Elongation in similar mixes runs from 460 to 400%.

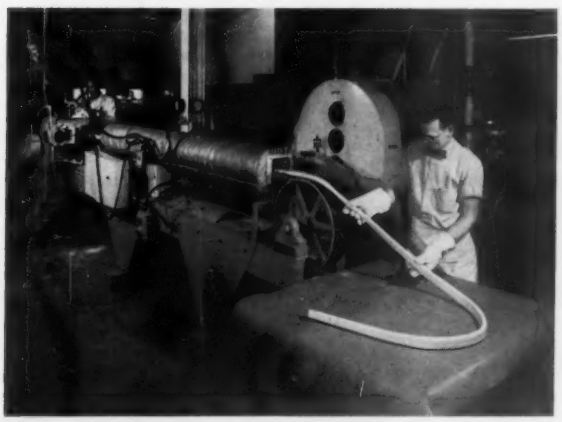
After covulcanization, a 50:50 mixture of Dow Corning 410 polymer and nitrile polymer withstood more than eight hours of exposure to ozone compared with less than 30 minutes for a straight nitrile stock. This same 50:50 mixture of Dow Corning 410 and nitrile had a brittle point of −70°F.

Although it is possible to vulcanize with elementary sulfur, we suggest the use of sulfur-bearing vulcanizing agents for better heat stability. Other ingredients should be adjusted to accomplish the covulcanization of the organic and the silicone rubber polymers. Certain carbon blacks, for example, tend to inhibit the vulcanization of the 410 Gum. Similarly, 5 parts of zinc oxide inhibits covulcanization. We suggest that no more than 3 parts of zinc oxide be used in blends containing 410 Gum. Unless care is taken to assure covulcanization of the 410 Gum, the silicone polymer will be an inert diluent that contributes nothing to the properties of the blend.

We recommend that the organic rubber polymer be softened on a mill or Banbury before the filler is added. To this mixture is then added the 410 polymer with its proportional amount of filler. After the first gradual addition, the silicone constituent can be added rapidly. The silicone polymer can also be masterbatched with organic rubber and then added with greater convenience.

Sulfur-vulcanizing silicone rubber permits rubber compounders to combine some of the desirable properties of silicone rubber with those of organic rubbers.

The compounding of silicone rubber is completed on conventional two-roll mills at temperatures low enough to prevent premature vulcanization. The balance of the filler, then the additives, and finally the vulcanizing agents are added to the polymer.



Continuous hot air vulcanization of silicone rubber facilitates production of simple and intricate extrusions, increases production, and minimizes scrap.

Coming soon . . .

The feature pages of an early issue of RUBBER AGE will be devoted to a "Design Manual on Rubber." Assembled for the purpose of guiding Army Ordnance Design Engineers toward the most advantageous use of rubber as components in Ordnance equipment, this manual supplies technical information in a concise, palatable form. It will prove a most valuable adjunct to the technical literature.

Quality Control of Vinyl and Polyethylene Electrical Insulating and Jacketing Materials

By R. C. BOYD

Manufacturing Department, Bakelite Company, a Division of Union Carbide and Carbon Corporation, Bound Brook, N. J.

BEFORE specifically discussing quality control of vinyl and polyethylene electrical extrusion materials, it is necessary to review the tenets upon which a logical quality control system is based. Very simply, any quality control system consists of routine surveillance of three items: raw materials, process, and finished product. It is essential that good testing methods be available which apply to each of these three items as required and which are meaningful in terms of finished product application. The systems used with such methods for one vinyl and one polyethylene material will be detailed.

VINYL INSULATING MATERIAL

The vinyl insulating material which will be discussed in detail is an opaque, flexible thermoplastic compound manufactured for extrusion both as a primary insulation at commercial power frequencies and as a jacketing stock. The raw materials contained in this product consist of vinyl chloride resin, an ester plasticizer, a combination of a calcium carbonate and clay filler, and a lead stabilization system. The process by means of which these various raw materials are fabricated into a finished extrusion material is outlined in Figure 1.

It will be seen from the drawing that all of the various raw materials are charged in the correct proportion to a ribbon-type jacketed blender. After proper mixing of all of these raw materials in this blender, this relatively crude mixture is then transferred to a Banbury mixer where it is exposed to high shear and high temperatures during its mixing cycle. After removal from the Banbury, the material is further homogenized on a two-roll mill, and then is transferred to a sheeting mill and fed to a granulator.

With this background, we must for purposes of establishing a quality control system, detail those properties desired in the ultimate application of the material as well as those additional properties desired by the extruder of the material (see Table I). It will be seen from the table that the properties which are of paramount importance to the fabricator or extruder are fairly practical considerations and ones which have to do principally with the extrusion operation. Obviously, all parties involved are interested in maintaining the basic properties desired in the final application. This is pointed out here because many design engineers sometimes conjure up theoretical materials which, while being suitable in ultimate application, cannot be manufactured or extruded.

Note: This paper was delivered at the Third Annual Signal Corps Wire and Cable Symposium, Asbury Park, N. J., December 7-9, 1954.

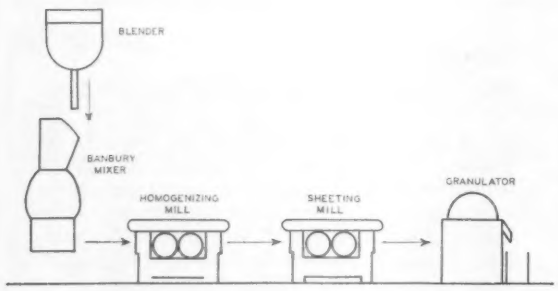


FIG. 1—Schematic diagram of hot processing line.

TABLE I—DESIRED PROPERTIES OF VINYL MATERIALS

Finished Extrusion	*Fabrication*
Insulation Resistance	Extrudibility
Tensile Strength	Color Contamination
Modulus of Elasticity	Bulk Factor
Ultimate Elongation	Granulation
Hardness	
Low Temperature Flexibility	
Deformation Resistance	

Primary and Secondary Properties

Taking a closer look at this list of properties, it is apparent that it would be unwise to attempt to control all of these variables without an understanding of the relationship of each to the raw materials and the process involved. Hence, we must first decide which of these properties are the primary or controlling ones and which are secondary in terms meaningful to the compounder of the plastic material. Further, we must assume that the proper formulation, when correctly compounded and extruded, yields an insulation or jacket which satisfies the requirements of the application. For purposes of simplification, we can group all of the properties and primary control points into three general categories, as follows:

General Property	*Primary Control Point*
Electrical	Raw Materials
Mechanical	Primary Weigh
Extrusion	Process

The electrical property of this vinyl material which is of particular importance is insulation resistance. Experience has told us that raw material variability is largely responsible for electrical variability in this fin-

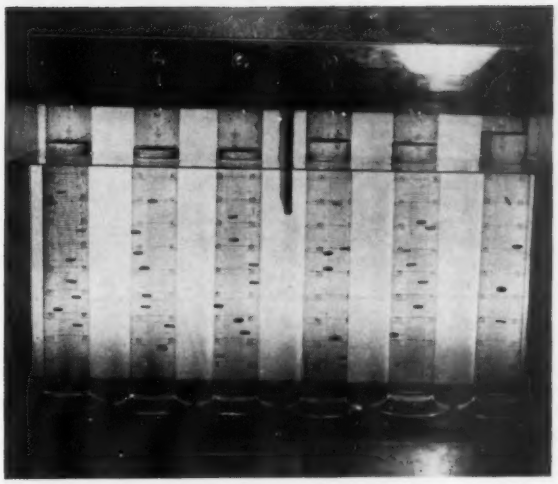


FIG. 2—Specific gravity columns.

ished product. Accordingly, the primary emphasis in electrical testing should be placed on the raw materials. Other properties of the raw materials, such as chemical composition, color, particle size, etc., are also of importance.

Hence, raw material specifications must be established to cover this point and an incoming inspection scheme should be designed to maintain these specifications. Since most of the raw materials involved are derived from a batch manufacturing process, the sampling scheme follows this. No recourse to a statistical sampling plan is necessary.

Raw material variation has little, if any, effect on mechanical properties providing these raw materials are controlled adequately by specifications. The major variable which adversely affects mechanical properties has to do with weighing errors. This is fairly obvious if one considers the large effects on tensile strength, etc., which are observed when an incorrect quantity of plasticizer is added at the primary weigh point. As a consequence, validity of weigh-up is believed to be the primary control on mechanical properties of the finished product. It can be easily controlled by means of sampling and testing the primary weigh prior to the time it passes through the remainder of the process. Specifically, tests which are applicable to this problem are specific gravity, tensile strength, and durometer hardness. Figure 2 shows an innovation as regards specific gravity testing which may well be of interest.

Testing for Specific Gravity

Illustrated in Figure 2 are a series of specific gravity gradient columns. Each one of these columns is constructed by carefully mixing a concentrated solution with a relatively dilute solution of the same inorganic salt. When this is done properly, a column having a uniformly variable density from top to bottom results. The specific gravity range represented by one of these columns is 1.20 to 1.25. The white disks suspended in the liquid are continuous calibrating disks and all that need be done in order to obtain a measurement of specific gravity of a solid plastic material is to drop it in the column and read off its specific gravity dependent upon the level which it seeks in the column. Most technologists are familiar with conventional tensile strength and durometer hardness testing and it is felt that no detail need be given at this time concerning these tests.

Assuming that the correct raw materials and proper weigh-up techniques have been used, the major control of extrusion characteristics on a given vinyl material is the manner in which these various raw materials are processed. It is well known that flexible vinyl formulations are mixtures in a relatively simple sense. The conventional hot processing line achieves a proper dispersion of these various raw materials. If the degree of dispersion is not sufficient, poor extrusion characteristics will result. Typical of this is roughness or surging which results in poor dimensional control and normally lower extrusion rates.

Extrusion Technique for Roughness

An extrusion technique has been devised utilizing a conventional laboratory size extruder where marginal conditions of extrusion are employed such that the material is exposed to an approximation of the most stringent operating conditions which would be encountered in the field. In other words, by means of this laboratory extrusion test a certain degree of roughness is purposely created in the material during extrusion and thus variability due to process can be catalogued and controlled. Figure 3 illustrates the various degrees of roughness experienced when utilizing this test. Rarely will any commercial extruder experience the highest degree of roughness shown.

Other properties of the material which are of great interest to the extruder or the fabricator have to do with particle size, bulk factor, color, and freedom from contamination. All of these factors are associated with the process and conventional controls are established to cover these points.

Returning to Table I, it can be seen that we have established specific controls on this material at various points in the over-all process and no mention has yet been made of how much checking should be done on the finished product itself. No attempt will be made here to describe how it is decided that some of these proper-

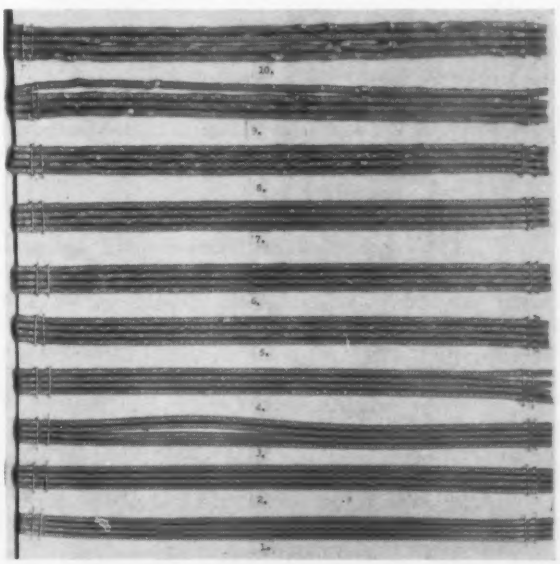


FIG. 3—Roughness scale for extrudibility rating.

ties are rechecked on the finished product if it has once been measured somewhere else. Briefly, it amounts to integrating one's complete knowledge of the precision of the tests involved, the process variability, and assaying the degree of risk one can assume. This job will vary from product to product as well as from manufacturer to manufacturer.

POLYETHYLENE INSULATING MATERIAL

In the case of polyethylene materials, compounding and the establishment of a quality control system are essentially the same as for the vinyl material just discussed. The polyethylene material we will be concerned with is a compound manufactured principally for use as a primary dielectric on wires and cables where extreme low-loss characteristics over a wide temperature and frequency range are desired. One of the most common uses for this material is in solid dielectric coaxial cables. This material is designed to meet the requirements of U. S. Government Specification MIL-D-3054A, Type N. The raw materials contained in this product consist of polyethylene resin and an antioxidant. The process by means of which these raw materials are compounded to yield a finished product involves a Banbury mixer, a homogenizing mill, a sheeting mill, and a granulator. Thus, it is essentially the same as the process used for the manufacture of the flexible vinyl material previously discussed.

Again it is desirable that one establish those properties desired in the ultimate application of the material as well as those additional properties needed by the extruder of the material prior to the time any quality control system be established. Table II details these particular properties.

Using the same approach as before, we can simplify this list of properties decidedly, along with the primary control point relative to each general group of properties, as follows:

General Property	*Primary Control Point*
Mechanical	Raw Materials
Electrical	Raw Materials
Extrusion	Raw Materials—Process

The mechanical properties of a polyethylene compound of this nature are controlled almost completely by the mechanical properties of the base resin used. Accordingly, raw material specifications must be established which limit the variables with which one is concerned.

The primary controller and most easily measured general property of polyethylene which approximates a measurement of average molecular weight is the property known as Melt Index. For those who are not familiar with this test, it is detailed as an ASTM Method under the designation D-1238-52T. This method describes a high-precision piston-operated extrusion apparatus. It has been our experience that the Melt Index values obtained on a given material are correlative with most basic mechanical properties of a given resin. Accordingly, the primary control on mechanical properties of the compound rests with a Melt Index control on the specific resin-type used. Secondary controls are also maintained for tensile strength, ultimate elongation, and brittle temperature.

In this particular material, dielectric properties are of extreme importance, and electrical controls involving the precise measurement of dissipation factor and dielectric constant should be maintained on both the base resin used and on the finished product. Another problem associated with the electrical properties of this material is the potential inclusion of contamination which might cause dielectric breakdown, so we must closely observe and control the presence of particles of extraneous material in our raw materials. This problem also extends into the process.

Table II—Desired Properties of Polyethylene Materials

Finished Extrusion	*Fabrication*
Tensile Strength	Extrudibility
Ultimate Elongation	Contamination
Brittle Temperature	Bulk Factor
Melt Index	
Dissipation Factor	
Dielectric Constant	
Dielectric Strength	

It should be stated here that the inclusion of the antioxidant in this compound is for the principal purpose of maintaining the dielectric properties of the material during its thermal processing life. The question of whether the antioxidant contributes to protection against the effects of outdoor exposure is a matter which involves the degree expected and this contribution by the antioxidant is in general questionable.

Extrusion properties of this polyethylene compound are associated primarily with base resin quality and the degree of dispersion achieved by all the raw materials during processing. In this case an extrusion control is maintained on the finished product utilizing essentially the same type of equipment as was described before.

Certain of the tests mentioned as being controls on the raw materials are used again to recheck the same property in the finished material. Again the decision as to which of these are to be rechecked and the frequency at which they are applied requires an integration of test precision, process variability, and risk.

For those interested in statistical methods, it can be stated that variables control charts are used wherever applicable. Statistical calculations are used to establish variability of testing methods and process and also to set up specification limits. Statistical design is used in experimentation almost exclusively. It should be emphasized though, that these statistical tools can be applied properly only if one uses common sense, sound engineering knowledge of the product and process, and good testing methods.

Summary

We have discussed two specific examples of how one can design and apply a quality control system to a given manufacturing process and product. It can be seen that one must have an intimate knowledge of all those variables associated with the product, the process, and raw materials, as well as definitive testing methods. A quality control system, if it is successful, operates, in the main, on raw materials and processing thus assuring an acceptable product as it is being made and not after it is manufactured. A nominal degree of inspection or quality assurance testing is necessary on the finished product in order that the quality control system itself be maintained.

Engineering Developments of Rubber July, 1953 – August, 1954

By LILLIAN SUTTER
Librarian, Rubber Division Library, University of Akron, Akron, Ohio
and LEORA E. STRAKA
Research Librarian, Goodyear Tire & Rubber Co., Akron, Ohio

The following annual report was presented before the Rubber and Plastics Division of the American Society of Mechanical Engineers in New York, N. Y., on December 2, 1954. Attention is drawn to the fact that it covers the period from July, 1953, to August, 1954. Although the material included in the first portion of the report is now somewhat academic, particularly with regard to the pending disposal of the government-owned synthetic rubber plants, it is being reproduced in full for its accurate and historical value.—Editor.

HIGH-LIGHTED in the news again this past year is the plan for the disposal of the government-owned synthetic plants. The plans have been moving right along with the passage of Public Law 205, appointment of the Commission, and acceptance of bids.

The major change in the final bill was the extension of the sale deadline to February 1, 1955 in hopes of answering the charge that the plants would be rushed into the hands of the big companies without adequate time for outsiders to study the properties and inject competition into the deals *(1)*. Two important amendments were also made in the final bill: one gives either house of Congress power to reject any plant sale by a majority vote; the other requires the attorney general to affirm to Congress that sales are not in conflict with anti-trust laws. The law specifies that a free competitive synthetic rubber industry be established and that disposal of the $500,000,000 facilities be consistent with the interests of national security *(2)*.

The Presidential Commission on the disposal of the synthetic rubber plants was appointed last fall. Early this year the three commissioners visited the synthetic plants for sale to gain first-hand knowledge of the situation *(3)*.

The official advertisement for the sale of the plants, released November 18, 1953, listed 13 GR-S synthetic plants, 2 Butyl synthetic plants, 1 styrene plant, 8 petroleum-butadiene plants, 1 dodecyl mercaptan plant, 2 alcohol-butadiene plants, 448 pressure tank (railroad) cars, and miscellaneous equipment *(4)*. In all, 274 inquiries were received concerning the plants, 50 the first week after the advertisement *(5, 6)*. Bids were accepted from November 25, 1953 to May 27, 1954, during which time 35 firms submitted 56 proposals and 19 alternates *(7, 8)*. More than one bid was received for 5 of the 27 plants, and 3 plants were without bids *(9)*. The Commission hopes that bidders who do not receive their first choice will take second choice on these others.

Negotiations must be completed by November 27, 1954 to permit the Commission to prepare its report for Congress. In determining the sale price, part of the acquisition cost must be that expense that would have to be met by the government if the government retained the plants. A bid may be accepted at any time during the negotiation period *(10)*. A special consideration that must be included in the negotiations is the fact that enough plants must be sold to assure production of 500,000 long tons of general purpose synthetic (GR-S) and 43,000 tons of Butyl rubber (GR-I) by private industry or the whole deal will be automatically cancelled *(11, 12)*.

Private industry has estimated that it will be possible to offer a delivery price of 25c a pound for GR-S as contrasted to the present government delivery price of 24.1c a pound *(13)*.

The Commission must file its report with Congress by January 31, 1955, following which time Congress has 60 legislative days to approve or veto all or part of the recommended sales *(2)*. After Congress has inspected and approved the disposal program, sales will be permitted within the 60 days following March 31, 1955. Any unsold plants would be taken off the market then for another year *(5)*.

A real blow to the three-man disposal Commission and Congress was the death of Representative Shafer this August. His knowledge of rubber problems and long experience in Congress was an invaluable aid in solving the political problems posed by his disposal law *(14)*.

The Government Laboratories at Akron are not to be sold with the synthetic plants and will be kept in operation for a year after the sale. Many industrial leaders believe that private industry can take over the research program and make it successful *(15)*. Others would like to have the Government Laboratories remain in operation as a pilot plant for government and private industry alike, with research service provided for industry on a fee basis. In this way, research for the Armed Forces could be continued also *(16-20)*.

A few of the suggestions made in answer to this important question are formation of an American Rubber Consumers Council, operation of the Government Laboratories by the National Science Foundation, and sale of the Government Laboratories to the University of Akron. The first would be a source of basic knowledge on rubber financed by a tax on each ton of rubber consumed *(21)*. The second would feature maintenance and expansion of the Government Laboratories with funds from the sale of the synthetic plants *(17)*. The third would sell the Laboratories to the University of Akron for a nominal sum and supply the University with an operating fund to maintain staff and equipment. The University has been operating the Laboratories under government sponsorship since 1944 *(17, 18, 19)*.

Reports on the last quarter of 1953 anticipating cuts in synthetic rubber production and an increase in the price of GR-S came true in part *(22)*. The first official act of Laurence Robbins, former RFC Administrator and head of the new Treasury Federal Facilities Corporation, successor of RFC, was to announce price increases from one to four cents a pound on government synthetic rubber. The 1c increase for Butyl raised its price to 23c, on a par with straight GR-S. Carbon black masterbatches and oil-carbon black masterbatches increased ¼c giving it a price range of 17¾c to 19½c a pound *(23, 24)*.

Despite the clamor of the rubber producers for more emphasis on natural rubber consumption, the unprecedented demand of the automobile firms on tire producers brought the "Big Five" rolling along toward record sales in 1953 *(25)*.

New figures of the Rubber Manufacturers Association reveal that rubber consumption hit a 12-month high in June, 1954. Both natural and synthetic rubber consumption increased, but the ratio of natural to synthetic declined slightly. For the first seven months of this year (1954), total rubber usage in this country dropped 16 per cent while consumption of tree rubber increased 3 per cent over the same period in 1953. The RMA reported total natural and synthetic rubber consumption was nearly one-fourth below the total a year ago *(26, 27, 28)*.

The phenomenal growth of the consumption of elastic materials illustrates the ever-expanding American economy. Tires take about 66 per cent of the rubber consumed in this country. Seal gaskets, wire insulating materials and belts help to make possible every labor-saving device in the modern home. Between 1920 and the present, engineers have increased from 120 to 540 the number of rubber items in an automobile *(29)*. All this explains why American consumption of rubber averages 19 pounds for every man, woman, and child as against a per capita use of only one pound for the remainder of the world *(30)*. Canada stands second on individual consumption, averaging 11 pounds per person per year *(31)*.

New Products and Developments

Uncured blends of a new type of styrene resin and any chloroprene rubber have been found to have good tensile strength, high stiffness, and heat distortion points of 190°F. and above. An outstanding feature of these blends is their high impact strength in the uncured state. By varying the ratio of the styrene resin and the chloroprene rubber, or by varying the type of styrene resin used, a wide range of physical properties becomes possible. These stocks can be calendered, compression molded, post-formed or extruded. Thus it is possible to manufacture end products that vary from flexible hose and shoe soles to tough carrying cases and athletic equipment *(32)*.

Presently being field-tested is Adiprene B, a urethane-type rubber stemming from the field of isocyanate chemistry. It is said to possess excellent abrasion resistance, high tensile strength, and resistance to oxygen and ozone degradation; however, it is difficult to process. Samples for industrial research will not be made available until further tests prove its theoretical value *(33, 34)*.

Rubber developments are lending new applications in aircraft. A new synthetic elastomer foam called "Airfoam SL" is said to be resistant to fire, and deterioration from sunlight, oil, and grease. The elastomer is based upon Chemigum SL, a polyester-urethane rubber which is easily processed and has good storage life. The material is ideal for use in cushions and mattresses in airplanes and ships where light-weight, non-inflammable materials are required. Because the chemicals used are delicately balanced and subject to accurate control, the texture of the foam product can be varied from that of a silky fine to a rough, coarse material to cover a wide range of applications *(35, 36)*.

Filastic is a new type of rubber produced by breaking down raw natural rubber into fiber form and reconstituting it into a web-like formation in which the fibers are locked wherever they cross. The product is said to provide great porosity, elasticity, flexibility, and considerably greater strength than conventional foam rubber. A ¼-inch thick sheet is so porous that tobacco smoke can be blown through it almost as readily as through a sieve, yet it is strong enough to be sewed or stapled at the edges and hold firmly. Potential markets for the new product are as "breathing" insoles for shoes, acoustical paneling, non-slip under-pads for carpets, surgical bandages, corsets and girdles, etc. In heavier sizes, the material will be strong enough for conveyor belting. No actual cost comparisons are yet available *(37)*.

Up until the present time over 150 fluoroethylene compounds have been introduced. Further developments of these compounds have led to a new Kel-F elastomer which is said to have an unusual combination of elastomeric properties, chemical resistance, and thermal stability. It is serviceable over a temperature range of −15° to 400°F. and is unaffected by hydrocarbon fuels and lubricants, oxygen, ozone, and sunlight. The elastomer is non-flammable, tough, abrasion and heat resistant, and is easily processed. Possible applications include fuel hose, diaphragms, gaskets, seals, O-rings, tank linings, containers, coatings for protective clothing, boots, and gloves used in handling corrosive materials. At present all available material is being used for military purposes *(38-41)*.

Rubber for use as an electrical conductor or an electrical insulation is still being modified and improved. Factors influencing the electrical resistivity of rubber-black compounds and the performance of some newly developed types of conducting oil furnace blacks have been investigated. Resistivity of rubber-black vulcanizates decreases rapidly when the loading increases from 10 to 50 parts by weight per 100 parts of rubber. By using special fine oil furnace blacks, conductive compounds may be made with a resistivity of about 20 ohm-centimeters *(42)*.

The Navy is putting rubber to a new use as the surface skin of submarines. The rubber panels provide protective housing for the sonar electronic gear. The panels are constructed to withstand the same sea pressures and forces that must be resisted by the outer hulls of conventional submarines, yet the specially developed rubber permits sound waves to pass through in about the same way sound travels through sea water to prevent blanking out or distortion of the sound signal *(43)*.

Two new lines of thought are being pursued in the pavement line. The first is the use of unvulcanized synthetic rubber pellets about the size of pencil erasers which break up in 60 seconds and are absorbed completely by a batch of asphalt. This results in a rubber "umbrella" over the main paving surface to keep water out, making the paving last longer. Since the pellets can be mixed at the job site, this eliminates the problem of transporting hot rubber-asphalt mixture which has been prepared at the chemical plant *(44)*. The second is the use of a new synthetic latex compound in place of asphalt. This is expected to improve weathering char-

acteristics of the pavement *(45)*. Both types of roads are being tested, and accurate reports of results are not yet available *(46)*.

Already traveling on these new roads are buses and coaches with all four wheels suspended on rubber and front wheels without a front axle. Torsilastic rubber springs give "knee action" never before available in busses. The springs look like large steel pipes and consist of a metal shell and central shaft. The space between the shell and shaft is filled with rubber bonded to the metal. Either the shaft or the shell is held stationary while the other is partly rotated by a torque arm. All the springing is accomplished by the twisting movement in the rubber. A hydraulic system, which operates on all four springs independently, maintains the same road clearance regardless of the load by winding or unwinding the springs as the load increases or decreases. The spring eliminates metal-on-metal vibration; there are no bearings to be lubricated or serviced, and no abrasion, rust, or wearing action from dirt, water or mud. The springs cannot develop squeaks or rattles *(47, 48, 49)*.

In view of the severe service conditions encountered in use, it is apparent that elastomer type of steam hose will fail prematurely unless it is specifically designed for the job for which it is intended. Elastomer steam hose having at least one layer of braided steel wire reinforcement is superior to hose having only non-metallic types of reinforcement. In addition to the apparent longer service life of elastomer steam hose having braided steel wire reinforcement, this type of hose is safer to use. It is believed that, if wire-reinforced steam hose should fail in service, the steam leakage would be relatively small and would not immediately result in a hazardous condition *(50)*.

Conveyor Belts

The subject of much interest this past year has been the increase and development of conveyor belts. They are now being used to transport anything from ore to tires to people for a few feet or a few hundred miles, Some are reinforced with rayon and others are reinforced with steel ribbons or spliced steel cables, depending upon the use and abuse to which they will be subjected *(51-55)*.

Rubber conveyor belts are most extensively used at present for transporting coal and iron ore. Part of the belt being used at the Pennsylvania Railroad's ore pier in the Delaware River at Philadelphia is the biggest ever made and shipped in one roll. Spliced at the site of installation, the 54-inch wide belt extends 1600 feet along a concrete pier to hoppers which feed the railroad cars and carries 3600 tons of ore an hour. There is a 16 degree incline on the last leg of the route *(56)*. A system of more than two miles of rubber belt-roads has opened another new iron ore frontier at the Marcona Mine near San Juan Bay, Peru. One belt of the system, 42 inches wide, travels 300 feet a minute and carries 2,000 tons of ore an hour. Ships can be loaded by belt and on their way to sea in less than eight hours *(57)*.

A conveyor belt, said to be the world's strongest, will soon be constructed for installation at a mining operation in northern Minnesota. The belt will have a maximum tonnage of almost one ton a second and will be used to haul low grade iron ore 1,000 feet on a line while lifting it 280 feet. In addition to 85 miles of high tensile steel cable and 7,000 square yards of belt fabric for plies, the belt will require 48,000 pounds of specially compounded rubber *(58)*.

Legislation will be proposed again in 1955 by the Ohio-River-to-Lake-Erie system to give conveyor belts the status of the common carrier, the same as other forms of transportation *(59, 60)*.

Subway passengers in Jersey City are benefiting from "moving sidewalks"; New York City will soon have a similar system available *(61, 62, 63)*. Plans are also in progress for a conveyor belt to be used in the New York Central railroad station in Buffalo *(64)*.

Development of a new type of rubber conveyor belt that sheds or retains water has been disclosed. Now in use in the production of taconite, a new source of iron ore, the belt automatically drains finely ground taconite as it conveys the wet material from storage tanks for processing The secret of the belt's dual performance lies in its unique cover design. Molded rubber ridges are formed in a continuous series of chevron patterns. Operated at a specified angle, the ridges channel water to the edges where it flows off the belt. By changing the angle, the ribs retain water on the belt *(65, 66)*.

Silicones and Seals

Although silicones have been available in one form or another since 1943, advances in silicone rubbers are still considered news *(67, 68)*.

Neither heat, pressure nor full exposure to air is required to cure RTV Silastic, a new silicone rubber. It develops the high and low temperature stability, water repellency and chemical resistance of silicone rubber within 24 hours after application. Two components, each containing a catalyst, are shipped and stored. Simple mixing in equal parts by weight yields the rubber *(69)*.

Aliphatic compounds have been investigated as possible wetting agents for silicone rubber-pigment systems, but they appeared to function as plasticizers rather than wetting agents *(70)*.

The chemical combination of silicone rubber and Teflon in a new product called "Super-Tough", results in a compound with improved tear resistance and oil resistance and excellent electrical properties. Super-Tough promises advantages as a sealant for synthetic base oils and in applications on ducts, clamp lines, diaphragms and general gaskets, and in aircraft ignition systems *(71)*.

The O-ring is a type of gasket which has come into wide use during the past few years. Natural and synthetic rubbers and silicone elastomers have been shown to meet the exacting requirements demanded in liquid and gas-tight seals *(72)*. O-rings are finding applications in rockets. At present, resilient seals may be obtained in a wide variety of elastomers for compatability with the entire range of rocket fuels. However, the nature of resilient seals makes them unsuited to long term storage applications where vapor pressures are involved *(73)*.

Tires and Tire Testing

The rubber industry is constantly seeking to improve its major product—tires. Tubeless tires are making the biggest news this year, but conventional tires have not been forgotten.

Recently unveiled is the Tournatrain, a rubber-tired locomotive and freight truck combination capable of economic operation over pathless desert sands or a cheaply constructed road through the Amazon or African jungle. The combination of electric self-propulsion in every wheel and large diameter and wide base tires providing flotation over sand and bog makes the Tournatrain practical and economical *(74, 75)*

Also new in the same line is a giant amphibious motor vehicle which rides six feet above the ground on its specially designed tires and accommodates 20 persons. The huge tires, 10 feet in diameter, enable the "buggy" to travel equally well over water, swamps, deep mire, or on dry land. Tread of the tires is smooth, but traction is obtained by means of rubber-cleated chains which give locomotion similar to that of a paddle wheel steamer *(76)*.

Quite similar to this amphibious vehicle is one suited for use on rough, shifting, or spongy ground, and which is right now designated for use in the North country on soft powdery snow. The vehicle is equipped with eight tires, each one ten feet high and four feet wide, which provide a high degree of support and flotation *(77)*.

A new method of determining tire temperatures has been developed. The instrument employs an electronic indicator and thermocouple injectors. To obtain the temperatures as close as possible to actual running conditions, the trucks are driven to the temperature station at full speed and stopped. The technicians obtain two temperatures on each tire while the driver measures air pressures. About 70 seconds after the truck has stopped, the temperature measurements are completed. The over-all accuracy of the present equipment is 0.1°F. which is far greater than obtained with the type previously used. (A millivolt-meter type portable instrument with a needle attachment for inserting into the tire treads was the previous method.) The greater speed at which the instrument indicates or records the different temperatures is another principal advantage *(78, 79)*.

A laboratory testing machine has been designed for the study of factors affecting the friction of tread compounds on ice. Of the test variables studied temperature has the greatest influence. Friction was also found to vary with pressure. The unusual frictional characteristics of rubber sliding on ice may be explained by taking into account the water layer formed between the sliding surfaces *(80)*.

Many of the major rubber companies have been continuing the development of the tubeless tire since it was introduced in 1947. This interest has been necessitated because the acceptance of tubeless tires has led to their use on military aircraft and on some types of farm vehicles as well as on passenger cars. Tubeless tires may become standard equipment for military aviation services and air lines. In addition to their ability to retain specified air pressures, tubeless airplane tires, in most sizes, weigh less than conventional tires with inner tubes *(81)*.

Tires without tubes are rapidly becoming standard equipment on many makes of new cars. Tests have shown a tubeless tire will run an average of 70,000 miles without failure while a conventional tire will go flat about once in every 19,000 miles of driving *(82)*. Although tubeless tires are more difficult to build and require more curing time, their increasing popularity and production has forced cuts in inner tube production *(83)*.

The majority of tubeless tires utilize a layer of gummy rubber under the tread which seals punctures when the penetrating object is removed. One line of tires also features a double liner of synthetic rubber extending over the entire inside of the tire and bonded permanently to the cord body. There is no inner tube to be pinched and chafed, and the liner protects against blowouts caused by bruises to the carcass and cord. The liner also helps to retain air in the tire, and the lighter weight of the unit permits smoother riding, better handling, and easier steering. Dangerous heat build-up caused by heavy tubes is lessened giving a tire which will run safely long distances at high speed in hot weather *(84, 85)*.

Another tubeless tire line uses high-strength nylon cord combining the safety features of tubeless tire construction with the extra strength of nylon cord *(86)*.

The most recent development is the tubeless tire which does not require an inner liner to seal in the air. The cord is pre-stretched to prevent tire growth, carcass separation and consequent air loss. The absence of heavy sealant permits lower running heat, and a 12 per cent greater mileage capacity is attributed to a flatter tread construction *(87, 88, 89)*.

Ozone and Rubber Cracking

Ozone is still the worst enemy of rubber. Therefore, since the presence of high ozone concentration in air is an important factor in determining rubber storage facilities, the rubber technician must have means of detecting and determining ozone concentration. Recently developed is a portable ozonometer which tells ozone concentration in air by graphically revealing the strength-loss of a strip of rubber held under tension *(90, 91)*. An automatic photoelectric instrument for the continuous measurement of the ozone in the earth's atmosphere at low altitudes has also been developed. The method, physical rather than chemical, is based upon the optical absorption characteristics of ozone. From the ratios of the deflections for the different spectral regions it is possible to determine ozone concentration in the range from a few tenths of one part to many parts per 100 million *(92)*.

There are two main phases in the cracking of strained rubber by ozone, namely formation and growth. In order to study the development of cracks in stretched rubber exposed to ozone, a technique of time-lapse cinemicrography has been used. In addition to giving a dynamic picture of the formation and growth of cracks, the film enables detailed measurements to be made throughout the whole process of cracking *(93)*.

In the presence of ozone, stretched rubber, although not visibly deteriorated, becomes traversed by sharp cracks. One explanation of this effect is "mechanical activation" of the double bonds in the rubber structure at the point of high stress. Another explanation is that the surface which has been newly formed by the stretching is unprotected by ordinary oxidation or gas absorption and is therefore more easily attacked by the ozone. This has practical significance concerning rubber connections, since the amount of ozone involved is infinitesimal compared to the conspicuous effect *(94)*.

On the other hand, compression greatly stabilizes rubber against ozonic destruction. Swelling by hot chemical reagents gives a temporary effect which disappears after a few days when the swelling agent diffuses into the interior *(95)*.

An investigation was made to determine the factors affecting ozone resistance, such as polymer type, ozone concentration, stress, type and amount of inhibitor, type and amount of migratory aid, static and dynamic exposure, and oven aging prior to ozone exposure. The cracking of natural rubber is characterized by numerous fine cracks which relieve the stress whereas GR-S compounds develop fewer, but larger, cracks. The investigation enumerates the desirable characteristics for antiozidants and lists several inhibitors of the alkyl *p*-phenylenediamine type and their effects *(96)*.

Compounding and Vulcanization

The conventional carbon blacks used in rubber compounding have been subjected continuously to extensive experimentation. A series of blacks has been heat treated to varying degrees of graphitization. The degree of graphitization is a function of the temperature and particle size of the carbon black. Graphitization changes the shape of the particle from spherical to well defined polyhedra, and the increasing degree of same is accompanied by progressive decrease in modulus properties of rubber compounds *(97)*.

Active carbon can be added to reclaim to prevent the discoloration of light-colored stocks by migration of staining materials in reclaim in adjacent stocks. The active carbon has an affinity or adsorptive capacity for the complex organic chemicals that cause staining, and thus prevents the migration. Particle size has no effect on anti-stain activity *(98)*.

Mineral fillers are generally recognized to be inferior to carbon blacks in their reinforcing properties, but the recent appearance of certain mineral fillers of fine particle size has made possible a fair degree of reinforcement, together with other desirable properties. Increased loading with mineral fillers markedly improves abrasion resistance. Mineral filled Butyl compounds having excellent ozone resistance can be prepared both by the proper selection of the grade of Butyl and by the use of certain compounding procedures. For a given grade of polymer, the ozone resistance improves with the state of cure *(99)*.

Treatment of lignin with hexamethylene tetramine in the presence of the rubber yields a vulcanizate in which tensile properties and hardness comparable with those of a black-reinforced compound are combined with the resilience of a pure gum compound. Lignosulfonic acid resulting from the acid wood pulp process has not shown the same promise as alkali lignin as a reinforcing filler in rubber *(100)*.

The oil resistance of polybutadiene may be improved without destroying its good low-temperature properties by introducing certain polar groups in a series of side chains. Mercaptoacetic acid, beta-mercaptoethanol, and 1-thiosorbitol improved the oil resistance, and the modified polybutadienes were superior to polybutadiene in tensile strength and essentially equal thereto in their low-temperature properties *(101)*. Examination of experimental polymers made by emulsion polymerization showed that improvements in oil and solvent resistance of polybutadiene realized by copolymerization with other monomers were invariably accompanied by a decrease in the excellent freeze resistance of the polybutadiene *(102)*.

An extensive survey of plasticizers for GR-S stocks to be used at low temperatures pointed out that, notwithstanding how much improvement in cold resistance results from the use of a certain plasticizer, for most applications the plasticizer must also be non-volatile and non-extractable by water if the cold resistance of the vulcanizate is to be retained in service *(103, 104)*.

The tensile and tear strengths, resiliency and wear resistance of Butyl rubber can be greatly increased by heating the mixture of raw Butyl rubber and carbon black prior to compounding with other ingredients. The heat treatment also increases the finished product's resistance to corrosive acids and to the passage of electricity. The improved properties will provide superior Butyl rubber products, even Butyl auto tires. The acid-resistant properties suggest application as a lining for storage tanks, and the electrical resistivity may apply for insulators *(105-108)*.

During the past year attention has been directed toward the use of radioactivity as a method of vulcanizing rubber. British investigations claim that exposure of natural and synthetic rubber to the atomic pile brings about cross-linking which closely corresponds to what the rubber chemist believes occurs during vulcanization. The length of exposure time required for the reaction is not long enough to permit the rubber to become radioactive, and it can be handled as normally vulcanized rubber as soon as it leaves the pile. The interesting point about physical "vulcanization" in the atomic pile is that cross-linking has been effected without the introduction of any extraneous atoms; nothing has been added, but the links have been joined by internal rearrangement of the molecular chains. Physical vulcanization in the pile appears to proceed entirely independently of any chemical vulcanization which may be present. The amount of change produced is dependent on the quantity of irradiation administered and is but little affected by temperature or intensity *(109, 110, 111)*.

As a result of recent investigations in the United States, it was found that a wide variation in physical properties occurred from the effects of radiation from Cobalt-60 depending upon the type of elastomer and variations in the compounding agents and conditions. Sulfurless accelerators provide better stability against the effects of radiation than do sulfur-containing accelerators. Hardening and embrittlement are the effects most commonly observed in exposed compounds. Some elastomers show some degradation or softening before the final stage of embrittlement. Only a very small proportion of the molecules are affected directly by primary radiation. The effects of radiation on elastomers are brought about by free radical mechanisms. The cross-linking character of the radiation induced reactions is indicated by an increase in modulus and a decrease in ultimate elongation. The most striking exception occurred in the case of raw natural rubber for which beneficial cross-linking reactions actually brought about a rudimentary cure. The effects were similar with raw GR-S but were not so pronounced *(112)*.

Testing Procedures

The use of bonded rubber mountings has become widespread in many engineering fields. However, some limitations are imposed upon the allowable stresses in designs because of possible bond imperfections from which early failure may result. Ultrasonic techniques have been applied to the detection of flaws inside flat bonded rubber mountings to make possible non-destructive examination of the mountings *(113)*.

Although the science of ultrasonics is not new, useful progress of this device has been made in the non-destructive testing of rubber. It has been found that the transmission of ultra-sound through rubber is particularly sensitive to air inclusion in the mass of rubber, a point which fits it particularly well for testing pneumatic tire carcasses for faulty ply adhesion. A worn casing may appear fundamentally sound as far as external appearances go, but the presence of internal voids would render it unfit for retreading *(110)*.

Radioisotope tracer techniques have been applied to the development of methods for the quantitative estimation of the surface cracking of elastomers. Crack volume is measured radiometrically from the volume of a radioactive powder included within the cracks. The use of radiations of different penetrability permits discrimination between volume and surface area of the cracks, the ratio of which is proportional to average crack depth *(114)*.

A new indentometer, acting under a constant load, can be used to determine the indentation of an elastomeric specimen at normal room temperature and at low temperatures, accurately, rapidly, and without appreciable friction between the moving parts and without any undue impact on the specimen *(115)*.

The flexibility of rubber and plastic products depends on the curvature to which they are bent. If information on the flexibility of belting or hose is needed for design or development purposes, it should be measured at the desired degree of curvature. A simple, yet sensitive, test can be used to measure the flexibility of uncut lengths of hose, even at extreme temperatures, utilizing an insulated box equipped with hand holes *(116)*.

Results of hardness tests of elastomer vulcanizates conditioned for short intervals at low temperatures are not always a true measure of the hardnesses which the vulcanizates will attain upon extended and prolonged exposure *(117)*.

The degree of crystallization in rubber compositions is dependent upon the rate of temperature lowering and the stress applied. The presence of crystallization is not so important as its continued development under long period exposure or its re-orientation under applied stress *(118)*.

Low temperature characteristics of elastomers are determined with an instrument which permits gradual instead of instantaneous loading of samples, enables the operator to increase and decrease the compression during the test, and provides means of determining the recovery characteristics of specimens under test *(119)*.

A study of variation of mechanical properties with the Mooney level of the elastomer and the effect of extending materials on the over-all properties of compounds containing the same high Mooney elastomer shows that the high Mooney rubber is inherently a better rubber than normal Mooney rubber in that the mechanical properties such as tensile, rebound, compression set, and resistance to creep all improve as the Mooney viscosity of the polymer increases. A wide range of physical properties can be obtained with high Mooney rubber by a suitable choice of softener and extender. Large amounts of low cost oil and black can be used without loss in physical properties *(120)*.

A satisfactory apparatus and method have been developed for testing the effect of long-time aging of elastomers under load. This method includes a measure of the change in modulus as well as the total amount of creep, both of which are necessary for evaluating elastomers for long term aging *(121)*.

LITERATURE REFERENCES

(1) "Sight Senate Approval of Rubber Sale." Milt Freudenheim. *Akron Beacon Journal*, July 21, 1953.
(2) "House and Senate Approve Compromise Bill for Sale of Government Synthetic Plants." *Rubber Age (N. Y.)*, **73**, 665 (1953).
(3) "Completes Plant Visits." *Rubber Age (N. Y.)*, **75**, 401 (1954).
(4) "Rubber Producing Facilities Disposal Commission: Invitations for Proposals." *Rubber Age (N. Y.)*, **74**, 210 (1953).
(5) "Disposal Commission Reports 274 Inquiries." *Rubber Age (N. Y.)*, **75**, 80 (1954).
(6) "Many Firms Get Data on Synthetics." *Akron Beacon Journal*, November 27, 1953.
(7) "Synthetic Plant Bidders All Eligible." *Rubber World*, **130**, 530-31 (1954).
(8) "First Step." *Rubber Age (N. Y.)*, **75**, 399 (1954).
(9) *Ind. Eng. Chem.*, **46**, No. 9, 7a (1954).
(10) "Disposal Commission Indicates Desire for Minimum of 'Horse Trading'." *India Rubber World*, **130**, 239-40 (1954).
(11) "Considering, Not Reneging." *Chem. Week*, **74**, No. 13, 26 (1954).
(12) "Plant Capacity of 500,000 Tons a Year Required to be Sold." *India Rubber World*, **128**, 506 (1953).
(13) "Phillips Offering Price for GR-S only 0.9c Higher." *Rubber World*, **130**, 813 (1954).
(14) "Up for the Third Time." *Chem. Week*, **75**, No. 15, 30-31 (1954).
(15) "How is the Future Fundamental Research on Synthetic Rubber to be Done?" *India Rubber World*, **128**, 630 (1953).
(16) "Industry Sponsored Rubber Research Program." H. J. Osterhof. *India Rubber World*, **130**, 197-202 (1954).
(17) "A Plan for Synthetic Rubber Research and Development." *India Rubber World*, **129**, 345-47, 357 (1953).
(18) "Akron University Plan." *Rubber Age (N. Y.)*, **75**, 81 (1954).
(19) "Akron U Proposal on Government Laboratories." *India Rubber World*, **130**, 240 (1954).
(20) "Future Military Elastomer Research Program; Effect of Government Facilities Disposal Act of 1953." J. H. Faull, Jr. *Rubber World*, **130**, 358-61 (1954).
(21) "More on the Future of Synthetic Rubber Research." *India Rubber World*, **128**, 775 (1953).
(22) "RFC May Cut Fourth Quarter GR-S Output; Considers Possible Increase in GR-S Price." *Rubber Age (N. Y.)*, **73**, 806-07 (1953).
(23) "RFC Announces Price Rise for Butyl Rubber." *Rubber Age (N. Y.)*, **75**, 551 (1954).
(24) "Butyl and GR-S Latex Prices Raised." *Rubber World*, **130**, 682 (1954).
(25) "Slightly Reduced Consumption Foreseen by RMA for This Year." *Rubber Age (N. Y.)*, **74**, 583 (1954).
(26) "World Natural Rubber Production Declining." *Rubber Age (N. Y.)*, **75**, 857 (1954).
(27) "Rubber Operations Lowest in 5 Years." Joseph E. Kuebler. *Akron Beacon Journal*, August 25, 1954.
(28) "Rubber Use in August Still Low." *Akron Beacon Journal*, September 24, 1954.
(29) "Auto Rubber Use Rises." *Rubber Age (N. Y.)*, **74**, 97 (1953).
(30) "U. S. Growth Paces Rubber's Expansion." Joseph E. Kuebler. *Akron Beacon Journal*, November 22, 1953.
(31) "Individual Consumption Up; Good Year Forecast." *Rubber World*, **130**, 544 (1954).
(32) "A New, Unvulcanized Composition of Resin and Rubber Having High Impact." R. J. McCutcheon and H. S. Sell. *Rubber World*, **130**, 362-65 (1954).
(33) "Novel Rubbers." *Chem. Week*, **75**, No. 1, 63 (1954).
(34) "DuPont 'Adiprene' B Being Tested." *Rubber World*, **130**, 820 (1954).
(35) "Goodyear Airfoam SL." *Rubber Age (N. Y.)*, **75**, 83 (1954).
(36) "Synthetic Rubber for Tires—Why Not 100 Per Cent?" *Rubber & Plastics Age*, **35**, 19-20, 22 (1954).
(37) "American Viscose Reveals Development of New Rubber." *Rubber Age (N. Y.)* **75**, 411 (1954).
(38) "Fluorocarbon Rubber Research." F. J. Honn, J. M. Hoyt, A. N. Bolstad, C. B. Griffis, and J. C. Montermoso. Paper presented before the Rubber Division of the American Chemical Society at the Fall Meeting in New York, September, 1954; Abstract: *Rubber Age (N. Y.)*, **75**, 697 (1954).
(39) "Kel-F Elastomer: A New Fluorocarbon Rubber." M. E. Conroy, L. E. Robb, D. R. Wolf, and F. J. Honn. Paper presented before the Rubber Division of the American Chemical Society at the Fall Meeting in New York, September, 1954; Abstract: *Rubber Age (N. Y.)*, **75**, 697 (1954).

(40) "Kel-F Elastomer: Fabrication and Applications." L. E. Robb, F. J. Honn, D. R. Wolf, and M. E. Conroy. Paper presented before the Rubber Division of the American Chemical Society at the Fall Meeting in New York, September, 1954; Abstract: *Rubber Age (N. Y.)*, **75,** 697 (1954).
(41) "M. W. Kellogg and U. S. Army Develop New Kel-F Elastomer." *Rubber Age (N. Y.)*, **75,** 84 (1954).
(42) "Electrical Conductivity of Rubber-Carbon Black Vulcanizates." B. B. S. T. Boonstra and Eli M. Dannenberg. *Ind. Eng. Chem.*, **46,** 218-27 (1954).
(43) "Rubber Panels as Part of Atom Sub's Hull." *Rubber World*, **130,** 684 (1954).
(44) "Rubber Road Pavements Pellets." *Rubber Age (N. Y.)*, **75,** 715 (1954).
(45) "Kentucky Tests Rubber Road." *Rubber Age (N. Y.)*, **74,** 273 (1953).
(46) "Rubber-Asphalt Use." *Eng. News-Record*, **153,** No. 13, 26 (1954).
(47) "Rubber Springs in Busses." *India Rubber World*, **129,** 804 (1954).
(48) "Bus with Four-Wheel Rubber Suspension." *Rubber World*, **130,** 385 (1954).
(49) "Busses Using Akron Rubber Spring." Joseph E. Kuebler. *Akron Beacon Journal*, February 4, 1954.
(50) "Investigation of Elastomer Steam Hose for Use with Saturated Steam at a Pressure of 200 Psi." S. A. Eller. *Rubber Age (N. Y.)*, **74,** 899-902 (1954).
(51) "Hot Stuff Coming Up." Gerald King. *DuPont Magazine*, **48,** No. 2, 12-13 (1954).
(52) "Conveyor Belts with Wire Ribbons." *Rubber World*, **130,** 712 (1954).
(53) "Goodrich Belt in Operation." *Rubber Age (N. Y.)*, **75,** 727 (1954).
(54) "Vertical Passenger Conveyor Belt." *Rubber World*, **130,** 536 (1954).
(55) "'Man-Lift' Belt Elevator." *Rubber Age (N. Y.)*, **75,** 872 (1954).
(56) "Biggest Conveyor Belt." *Akron Beacon Journal*, July 28, 1953.
(57) "Use Belts at Peru Mine, Docks." *Akron Beacon Journal*, July 28, 1954.
(58) "'Strongest' Conveyor Belt." *Rubber Age (N. Y.)*, **75,** 253 (1954).
(59) "Model of Riverlake Conveyor." *Rubber World*, **130,** 535 (1954).
(60) "Goodyear Constructs Working Model of Riverlake Belt Conveyor." *Rubber Age (N. Y.)*, **75,** 708 (1954).
(61) "To Build Passenger Conveyor." *Rubber Age (N. Y.)*, **74,** 282 (1953).
(62) "Speedwalk Begins Operation in Jersey City." *Rubber World*, **130,** 534 (1954).
(63) "Rubber Belt Subway a New York Reality." Robert Bordner. *Akron Beacon Journal*, March 9, 1954.
(64) "To Build Conveyor in Buffalo." *Rubber Age (N. Y.)*, **75,** 565 (1954).
(65) "Ridged Surface Conveyor Belt." *India Rubber World*, **129,** 392 (1953).
(66) "New Goodrich 'Riffle Grip' Conveyor Belt Sheds and Retains Water." *Rubber Age (N. Y.)*, **74,** 269 (1953).
(67) "New Developments in Silicone Production." *Rubber Age & Synthetics*, **34,** 215 (1953).
(68) "Dynamic Characteristics of Silicone Rubber." G. W. Painter. *Rubber Age (N. Y.)*, **74,** 701-06 (1954); *Rubber India*, **6,** No. 4, 23-28, No. 5, 23-24 (1954).
(69) "Silicone Rubber Vulcanizes at Room Temperature." *Chem. Eng.*, **61,** No. 5, 154 (1954).
(70) "Compounding of Silicone Rubber." Arbelia C. Glime, Norman A. Duke, and Clinton M. Doede. *India Rubber World*, **128,** 766-70, 744 (1953).
(71) "Silicone Rubber Advance." G. S. Irby, Jr., and W. G. Holt. *Aero Digest*, **68,** No. 2, 73-74 (1954).
(72) "Materials for O-Ring Seals; Their Properties and Selection." E. L. Carlotta. *Materials & Methods*, **38,** No. 6, 104-07 (1953).
(73) "Aspects of the Design and Fabrication of Liquid Propellant Rocket Engines." H. Davies. Paper presented before the American Rocket Society at the ASME Annual Meeting in New York, December, 1953; Abstract: *Machine Design*, **39,** No. 6, 333-34, 336, 338 (1954).
(74) "Letourneau Develops Rubber-Tired Railroad." *Rubber Age (N. Y.)*, **73,** 804 (1953).
(75) "Rubber-Tired Locomotive and Freight Truck." *Rubber Developments*, **6,** 88-89 (1953).
(76) "New Version of 'Marsh Buggy'." *Rubber World*, **130,** 686 (1954).
(77) "Letourneau Sno-Buggy Utilizes World's Largest Pneumatic Tires." *Rubber Age (N. Y.)*, **75,** 721 (1954).
(78) "Tire Temperature Measurement at the Government Tire Test Fleet." V. J. Horning. *Rubber Age (N. Y.)*, **74,** 395-96 (1953).
(79) "Use of Synthetic Rubber in Truck Tires." I. I. Siothun and P. S. Greer. *Rubber Age (N. Y.)*, **74,** 77-83 (1953).
(80) "Study of the Factors Affecting the Friction of Tread Compounds on Ice." C. S. Wilkinson, Jr. *India Rubber World*, **128,** 475-81 (1953); *Rubber Chem. & Tech.*, **27,** 255-70 (1954).
(81) "Navy Using BFG 'Tubeless'." *Akron Beacon Journal*, July 4, 1954.
(82) "Tubeless Tires on All Packards." *Akron Beacon Journal*, July 1, 1954.
(83) "Revolution in Rubber from 'No-Tube' Tires." *Tire Review*, **54,** No. 9, 11, 42 (1954).
(84) "Non-Skidding Tubeless Tire; Puncture-Sealing Tubeless Tire." *India Rubber World*, **129,** 534 (1954).
(85) "'Safetyliner' Tubeless Tire." *Rubber Age (N. Y.)*, **73,** 540 (1953).
(86) "Tubeless Tire with Nylon Cord." *Rubber Age (N. Y.)*, **73,** 542 (1953).
(87) *Tire Review*, **54,** No. 8, 17 (1954).
(88) "Goodyear Tubeless Tires." *Rubber Age (N. Y.)*, **75,** 878 (1954).
(89) "Goodyear Unveils Complete Line of Tubeless Tires." *Rubber World*, **130,** 816 (1954).
(90) "Goodrich Develops Ozonometer." *Rubber Age (N. Y.)*, **75,** 722 (1954).
(91) "Sizing Up the Enemy." *Chem. Week*, **74,** No. 20, 112 (1954).
(92) "Continuous Measurement of Atmospheric Ozone by an Automatic Photoelectric Method." Ralph Stair, Thomas C. Bagg, and Russell G. Johnston. *J. Research Nat. Bur. Standards*, **52,** 133-39 (1954).
(93) "Ozone Cracking: A Cinematographic Study." Doreen M. Smith and V. E. Gough. *Trans. Inst. Rubber Ind.*, **29,** 219-37 (1953); *Rubber Chem. & Tech.*, **27,** 175-91 (1954).
(94) "The 'Chemical Knife'." H. O. Albrecht. *J. Chem. Phys.*, **21,** 1421-22 (1953).
(95) "Protection of Rubber from Ozone Cracking." Yu. S. Zuev. *Doklady Akad. Nauk. S. S. S. R.*, **93,** 483-86 (1953); *Chem. Abs.*, **48,** 7329h (1954).
(96) "Antiozidants for GR-S Rubber." R. F. Shaw, Z. T. Ossefort, and W. J. Touhey. *Rubber World*, **130,** 636-42 (1954).
(97) "Structure and Properties of Carbon Black; Changes Produced by Heat Treatment." W. D. Schaeffer, W. R. Smith, and M. H. Polley. *Ind. Eng. Chem.*, **45,** 1721-25 (1953).
(98) "Active Carbons as Anti-Stain Agents for Reclaimed Rubber." J. J. Keilen and W. K. Dougherty. *India Rubber World*, **129,** 199-205 (1953).
(99) "Compounding Butyl Rubber for Mineral-Filled Stocks." W. C. Smith. *India Rubber World*, **129,** 55-60 (1953).
(100) "Compounding Natural Rubber with Lignin and Humic Acid." F. J. Tibenham and N. S. Grace. *Ind. Eng. Chem.*, **46,** 823-28 (1954).
(101) "Polybutadiene Modified by Addition of Thiols Containing Polar Groups." C. S. Marvel, K. G. Clarke, H. K. Inskip, W. K. Taft, and B. G. Labbe. *Ind. Eng. Chem.*, **45,** 2090-93 (1953).

(102) "Evaluation of Diene-Type Elastomers for Oil and Solvent Resistance and Low Temperature Flexibility." R. W. Laundrie, Milton Feldon, and A. L. Rodde. *Ind. Eng. Chem.*, **46**, 794-803 (1954).

(103) "Permanence of Plasticizers in GR-S Vulcanizates Exposed to Weather." Ross E. Morris and Arthur E. Barrett. *Rubber Age (N. Y.)* **75**, 76-78 (1954).

(104) "Specifying Elastomers for Low Temperature Service." *Materials & Methods*, **38**, No. 5, 114-18 (1953).

(105) "Prevulcanization Heating of Butyl-Carbon Black Compounds." *India Rubber World*, **129**, 616 (1954).

(106) "The Reinforcement of Butyl with Carbon Black. Part I. Heat Treatment: Methods and Effects." A. M. Gessler. *Rubber Age (N. Y.)*, **74**, 59-71 (1953).

(107) "The Reinforcement of Butyl with Carbon Black. Part II. Specific Action of Surface Oxygen." R. L. Zapp and A. M. Gessler. *Rubber Age (N. Y.)*, **74**, 243-51 (1953).

(108) "The Reinforcement of Butyl with Carbon Black. Part III. The Action of Promoting Agents." A. M. Gessler and F. P. Ford. *Rubber Age (N. Y.)*, **74**, 397-408 (1953).

(109) "Atomic Cross-Linking of Rubber." *Rubber & Plastics Age*, **35**, 94 (1954).

(110) "New Tools for Research; Help from the Atomic Pile." T. H. Messenger. *India Rubber Journal*, **125**, 989-90, 992, 994, 996, 1002 (1953).

(111) "New Method of Vulcanizing Rubber: Use of Radio-Activity." *Rubber Age & Synthetics*, **34**, 337 (1953).

(112) "Changes in Elastomer Due to Radiation from Cobalt-60." S. D. Gehman and L. M. Hobbs. *Rubber World*, **130**, 643-46 (1954).

(113) "Non-Destructive Examination of Flat Bonded Rubber Mountings." D. M. Heughan and D. O. Sproule. *Trans. Inst. Rubber Ind.*, **29**, 255-65 (1953).

(114) "Application of Radiometric Procedures to the Evaluation of Surface Cracking of Elastomers." Joseph L. Kalinsky and T. A. Werkenthin. *Rubber Age (N. Y.)*, **75**, 375-84, 441 (1954).

(115) "The Material Laboratory-Admiralty Indentometer." J. Z. Lichtman and C. K. Chatten. *India Rubber World*, **129**, 61-62 (1953).

(116) "Simple Flexibility Test." Dietrich G. Stechert. *Anal. Chem.*, **25**, 1730-33 (1953).

(117) "Effect of Arctic Exposure on Hardness of Elastomer Vulcanizates." Ross E. Morris and Arthur E. Barrett. *India Rubber World*, **129**, 773-75 (1954).

(118) "Yield Stress in Frozen Rubbers." J. M. Buist and R. L. Stafford. *Trans. Inst. Rubber Ind.*, **29**, 238-54 (1953); *Rubber Chem. & Tech.*, **27**, 104-19 (1954).

(119) "An Instrument for Determining the Relaxation and Recovery of Elastomers." B. G. Labbe and W. E. Phillips. *India Rubber World*, **129**, 489-91 (1954).

(120) "Mechanical Properties of High Mooney Elastomers." P. J. Earley and M. J. Sanger. *Rubber Age (N. Y.)*, **75**, 65-72 (1954).

(121) "Long-Term Aging of Elastomers Under Continuous Shear Load." G. L. Hall, F. S. Conant, and J. W. Liska. *India Rubber World*, **129**, 611-16 (1954).

Firestone Handling System Uses Conveying Car for Weighing

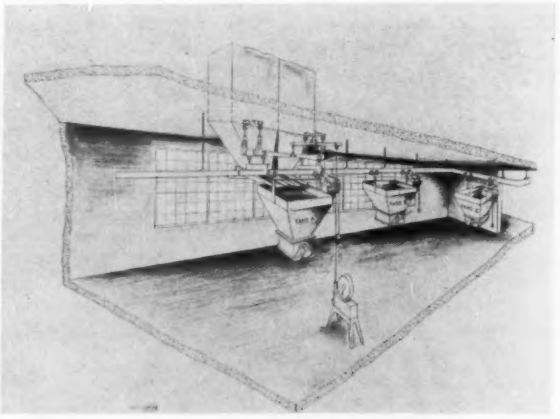
AN unusual method for weighing out bulk material and delivering it to process equipment has been worked out by the Richardson Scale Co., of Clifton, N. J., for the Firestone Tire & Rubber Co. at its Hamilton, Ontario, Canada, plant. In this operation, rubber pellets are fed directly from screw feeders to a hopper car that is suspended on a return monorail.

In the operation, a prescribed quantity of material is automatically deposited in the car and its weight automatically checked for correctness. The hopper car is then propelled along the monorail to the Banbury mixer. After discharging its load, it is returned to the loading station. Each weighing may be observed on a large scale dial, and individual net weighings are recorded. The entire weighing operation is set up and controlled from a remote panel board. If weighings are over or under the prescribed amount, an alarm is sounded at this board.

Advantages of the system are reported to include absolute control over the net weighing operation, high accuracies, easy and quick weight changing, minimum labor requirements, and low-initial expenditure for weighing equipment. A section of the monorail is hooked up to a scale-beam system and acts as a scale, with the hopper car functioning as a weigh hopper. The scale-beam mechanism is identical to the standard beam arrangement used on the Richardson automatic scales, and has the accuracy of the standard mechanism.

A feature of the system is the automatic and instantaneous tare-weighing of a hopper car before loading begins. Advantage of the taring process: The weight of the hopper cars runs between 450 and 500 pounds. If weights were not tared, cars would of course have to be exactly the same weight in order to have each deliver identical weights. The heart of the weighing system is a high-precision servomechanism system, developed by Richardson Scale. In this system, transducers are located at the dial scale, weight-selector dial, remote indicator, and the recorder.

At the Hamilton plant, two monorail weighing systems, feeding two Banbury mixers, are in operation. Hopper cars have capacities of 500 pounds. Two grades of pelletized rubber, fed by two screw conveyors, may be loaded into the car from each loading station. Weights are changed as many as three times a day in each system, depending upon the type of rubber being compounded. One man runs the entire weighing and handling operation.



Sketch showing the method used by Firestone at its Canadian plant to feed rubber pellets direct from the screw feeders to a hopper car suspended on a return monorail. The hopper cars move along the monorail to the Banburys.

How Firestone Minimizes Carbonization of Equipment in Its Pottstown Tire Plant

By R. F. REPENNING

Staff Engineer, Lubricants Department, Shell Oil Co., New York, N. Y.

ANY grease, no matter what its composition, will eventually oxidize, even at relatively low temperatures. It follows that where higher temperatures are involved, oxidation will proceed more rapidly, the rate roughly doubling for every 20° F. rise in temperature.

Carbonization is in reality the end result of this self-same phenomenon. Fortunately, carbonization is not noted to any appreciable extent until higher operating temperatures are encountered, the rate again increasing with a rise in temperature. Oxidation, being a chemical change, implies a gradual change in the basic composition of the grease and may impart to it properties totally different from those it originally possessed. It causes a general deterioration of the grease, seriously impairs its lubricating properties, and may in time cause corrosion.

When high temperatures cause carbonization in feed lines they become plugged and fresh grease is prevented from reaching vital bearing surfaces. The only remedy, then, is to dismantle the bearings and feed lines involved and clean them out completely.

Several types of machines in a tire plant, particularly those operating at or above about 300° F., are extremely susceptible to carbonization. Typical of these are the automatic curing stands in the Pottstown (Penna.) plant of the Firestone Tire & Rubber Company. Any grease used in the stands has to be able to withstand very high temperatures without ill effect.

FIG. 1—Automatic curing stands at Firestone's Pottstown plant are lubricated with lithium grease once a month. Four high temperature fittings on each machine are greased every week.

FIG. 2—A competent oiler can completely grease a Bag-O-Matic press in 15 minutes. Each unit takes about one pound of Alvania grease.

The first grease Firestone used was a conventional EP (extreme-pressure) grease. When this did not work out, several other types of EP greases were tried. Even a bentone-base grease, and ultimately a silicone-base grease were used, but none permitted continuous operation of the curing stands without lubrication difficulties.

Five years ago Firestone had started to use a lithium 12-hydroxy stearate grease in some of the Banbury mixers. Because it seemed to exhibit unusual mechanical and oxidation stability, it was decided to try the same grease in several dozen curing stands. Results so far have been highly satisfactory.

Each stand has 39 individual grease fittings, which are periodically lubricated by an oiler, using a pressure gun. Most of the fittings and connected grease lines are at temperatures varying between 80° and 200° F., and are lubricated once a month (Figure 1). Four fittings—two in the dome cavity and two in the elongation cylinder of the air bag—go well above 300° F.; these are greased every week. It takes something like fifteen minutes and about one pound of Shell Alvania EP Grease 2

(a product of the Shell Oil Company) to lubricate one stand completely (Figure 2).

In addition to eliminating carbonization in the lines, Alvania EP Grease also has good pumpability. This property is of particular importance when using central lubricating systems to assure a continuous supply of grease.

Banbury mixers are automatically lubricated. Some of the mixers are capable of handling 200 pounds of material at a clip while others handle 400-pound batches. A pump, mounted on each mixer (Figure 3), is hand loaded with 5 pounds of grease every 12 hours. Pressure generated in the pump forces measured quantities of the grease to several sets of distribution blocks, these blocks being mechanically cycled to inject the grease into vital bearings.

Worthy of note is the fact that the Banbury mixers are heated with 100 psig saturated steam (about 330° F.), fed into both the hollow journals and into the jacket surrounding the rolls. Under these operating conditions the lithium-base grease has held up much longer than other greases.

Similar methods are applied in lubricating the flap presses (Figure 4). The automatic lubricators build up a pressure of 3000 psig after six cycles of operation, then utilize this pressure to introduce the lithium-base grease at 14 points. It takes approximately one pound per week to keep each machine in top operating condition.

As an added protection against machine breakdown caused by inadequate lubrication, certain safety devices have been installed on the Banbury mixers and the flap presses. These will trip the machine if the grease supply should become exhausted or if the lubricators should fail to function.

One of the principal advantages of a multi-purpose grease, such as Alvania, is the fact that one grease may be used in a variety of applications. Thus, the operator or lube man need not worry about incorrect applications, using perhaps a water-resistant (calcium-base) grease when a high-temperature (sodium-base) grease is called for, or vice versa. The lithium-base EP grease being used not only may be applied over a wide range of temperatures, but it also offers better water resistance than many other types of EP greases.

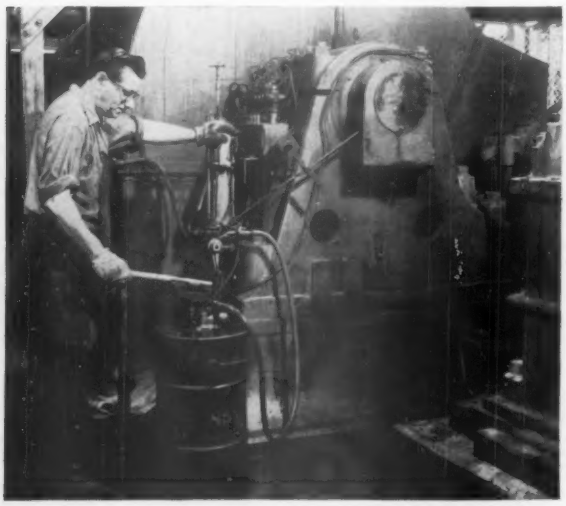


FIG. 3—The pumps mounted on each Banbury are hand loaded with five pounds of grease every twelve hours. Here an oiler is replenishing grease supply.

FIG. 4—Flap presses are lubricated automatically after every six curing cycles at the Pottstown plant.

On occasion this grease has also permitted the equipment to be in operation far beyond normal expectations. One of the gear type couplings interposed between a 500-hp motor and one of the Banbury mixers has been in operation for nine years without needing a major overhaul. However, after a while the lubricating oil recommended by the manufacturer (140 seconds SUS at 210° F.) no longer afforded sufficient lubrication, and it required 3 quarts of make-up oil per week. This was eliminated by substituting the multi-purpose grease for the oil. Now, the reduction unit is checked once a week, and some grease is added if necessary. Once every six months the unit is flushed out with five to six pounds of Alvania.

This is one of the few instances where it is felt there is no such thing as "overgreasing"; and yet, despite the fact that the grease is applied quite liberally, the gear coupling needs only about 16 pounds per year, including the two complete changes.

A specially designed Jones type riffle for mixing fine grained materials and obtaining homogenous splits and microsamples is reported to be finding increased uses in industry. Called the **Sepor Microsplitter,** it finds application in the rapid and accurate preparation of small samples. It is available from Sepor Microsplitter Supply, 1545 South Oak Park Ave., Berwyn, Ill.

Reliance Electric & Engineering Co., Cleveland 10, Ohio, has announced a new line of **totally-protected a.c. motors.** Regardless of mounting positions, the new motors are said to offer complete protection against drip, splash and falling objects. Positive seal between frame and conduit boxes are assured by new neoprene gaskets.

A new line of more **compact rotating unions** for water and steam service to 300°F. for cooling and heating rotating shafts, drums and cylinders has been introduced by the Deublin Co., Glenview, Ill. Known as double-purpose unions, all component parts are alike for both the ½-inch and ¾-inch service, with the exception of the rotors.

Editorials . . .

Last Mile

THE final decision on the sale of the government-owned synthetic rubber production facilities to private industry will be made within the next week to ten days. By the time some of our subscribers read this editorial this decision will already have been made. Accordingly, some of the comments made at this point could readily be academic by the time they are read. However, for what they may be worth, here they are.

As this is being written, hearings are being held in Washington on the disposal program submitted to Congress by the Rubber Producing Facilities Disposal Commission. This program was submitted on January 24 and spelled out in considerable detail the facilities involved, the bidders, the initial bids, and the final bids. The bids covered twenty-four of the twenty-seven facilities still remaining in government hands. It was the consensus of opinion that the Disposal Commission had done an excellent job and had submitted a program which would meet with Congressional approval.

The purpose of the hearings currently being held is to give the public at large a final opportunity to make itself heard on the validity and legality of every aspect of the pending sales. Once Congress approves the program all sales become due and binding and there can be no turning back. Griping will still be permissible, but it will have no legal standing. Unless Congress vetoes the sale of any one or more plants, the negotiated contracts will take effect on March 25. Arrangements have already been made to turn over the plants to their new owners between April 21 and 29, providing there is no veto.

The hearings have two specific purposes, the first dealing chiefly with the bill designed to reopen bidding on the Baytown, Texas, copolymer unit, currently operated by the General Tire & Rubber Co., on which the Disposal Commission turned down General Tire's offer, and the second to hear any objections from industry to any of the negotiated contracts. Reopening of the bidding is believed to have serious legal aspects where other negotiated contracts are involved, and it is doubtful that Congress will wish to risk the negotiated bids this late in the game. The Disposal Commission has recommended putting the Baytown plant in mothballs for a three-year period.

Far more important is the second phase of the hearings, namely, that portion devoted to hearing objections to the planned sales. Specific charges were expected to be levelled by the Minnesota Mining interests with regard to the legality of the bid made by the Shell Chemical Corporation, which was approved by the Disposal Commission. This bid covered the styrene, butadiene and copolymer units in the Los Angeles area, and a single bid was made for all three facilities. It is believed that the Minnesota Mining people will allege that Shell failed to comply with the law by neglecting to make individual bids for each of the three plants. This is an interesting point, and may require a decision by the Attorney General. It is even conceivable that if the triple bid is approved by Congress, there may be a subsequent decision sought in the courts.

It is possible that some other objections to the negotiated bids will be entered during the hearings, particularly with regard to possible monopoly. This is a subject which always commands the attention of Congressmen, irrespective of the validity of the charges. Whatever the hearings bring forth, it is extremely doubtful at this stage whether any charges will have sufficient weight to change the thinking of Congress, which at this point is believed to heavily favor complete approval of the disposal program as submitted by the Disposal Commission. Within the next several days supposition will become fact, and a new era may be ushered in for the rubber manufacturing field.

Moving Day

FOR the second time in three years, RUBBER AGE is moving to new and larger quarters. Our new and expanded facilities will permit additions to our staff and will, in addition, give us the extra "elbow room" to provide better services to our readers. May we at this time extend an open invitation to all our reader-friends to visit us at our new home. We hope that you will be pleased with us that it is only through your acceptance of our products, RUBBER AGE and RUBBER RED BOOK, that we are permitted to grow. We hope that we will continue to grow with the industry we serve. So then, after March 18, 1955, please address all your correspondence to us at 101 West 31st Street, New York 1, N. Y. Our new telephone number will be: PEnnsylvania 6-6872.

Highlights Sidelights *of the News...*

March, 1955

Unconfirmed reports state that some opposition may yet develop to the re-opening of negotiations to permit the purchase of the Baytown, Texas, GR-S plant . . . Two bills have been introduced, one in the House and the other in the Senate, authorizing the Disposal Commission to sell the plant . . . It has been reported that purchasers of some of the other GR-S plants are against an extension of the negotiation period (page 897).

The decision by the Disposal Commission in approving a "package" bid by Shell Chemical for three West Coast facilities has come in for criticism by the Minnesota Mining and Manufacturing Co. . . . 3M states that the procedure in which Shell Chemical failed to assign a specific price to each of the three plants made it impossible to outbid the company during subsequent negotiations . . . 3M has petitioned the Senate Banking Committee to require the Disposal Commission to set aside the Shell Chemical contract (page 897).

Malayan rubber traders are said to have lost more than $3,000,000 in American funds as a result of the break in market prices and as one result of the U.S. government's new stockpile rotation program (page 944) . . . Under the new rotation regulations, the ceiling on upgrading will be increased from 5,000 to 7,500 tons a month . . . In addition, the new regulations extend the time within which purchases of rubber from the stockpile must be replaced (page 898).

The recent dismissal of the federal anti-trust suit against the DuPont interests and the General Motors Corp. will be appealed, according to Attorney General Brownell . . . However, the Justice Department has apparently decided not to re-open that phase of the case relating to U. S. Rubber and individual members of the du Pont family (page 903).

A.S.T.M. Committee D-11 on Rubber and Rubberlike Materials, at its recent meeting in Cincinnati, decided to establish a new subcommittee on Synthetic Elastomers . . . This action followed a report received from operators of the synthetic rubber plants recommending that six test methods for solid polymers, now published under the government's synthetic rubber program, be established as A.S.T.M. standards (page 905).

The Secretariat of the International Rubber Study Group reports that 1954 was the third best production year for natural rubber, being exceeded only by 1950 and 1951 . . . World consumption of natural rubber in 1954 set a new record high of 1,725,000 long tons (page 899).

NEWS REPORTS and Industry Activities

FFC REPORTS AMPLE SYNTHETIC RUBBER STOCKS; ADVANCE ORDERS FOR GR-S AT RECORD LEVELS

THE Federal Facilities Corporation stated on February 27 that it can meet all requirements for synthetic rubber despite a "significant buying spree" which has pushed demand to record heights. A report that a serious shortage has developed brought an emphatic denial from the government agency. "We are taking care of the needs of all our small customers," an FFC official declared, stating that some of the larger companies are trying to "stock up" as insurance against possible future shortages.

Advance orders for GR-S have amounted to 66,000 long tons for March delivery and 69,000 long tons for April. These orders, FFC stated, will be met by stepping up production to full capacity—about 61,000 long tons a month—and by drawing on government-owned inventories. Subject to Congressional approval, the government-owned synthetic rubber producing facilities are scheduled to be transferred to private ownership on April 30.

The trade reports that fears of shortage have been precipitated largely by the steady rise in industry activity since last autumn. This upsurge is motivated by heavy production in the automobile industry and others using large quantities of rubber products. This increased activity has already led some major tire companies to revise their estimates for new rubber consumption in 1955. Last December, the Rubber Manufacturers Association predicted consumption of 1,255,000 long tons in 1955. Revised estimates now place 1955 consumption at the 1,330,000 long ton level. Actual consumption in 1954 amounted to 1,232,886 long tons.

Inventories Declining

FFC states that it expects to close the synthetic rubber program on April 30 with a little under 40,000 long tons in inventory. This figure is about one-third less than FFC predicted a few months ago. Government stocks dropped steadily from over 80,000 long tons last spring to 57,000 long tons on December 31, 1954.

The government will distribute whatever rubber it has on hand among the private companies which have contracted to buy government-owned GR-S plants. The purchasers have agreed to resell this rubber to FFC's present customers at present prices to help tide over any interruptions in supply during the transfer of plant ownership. About eight hundred companies now buy GR-S from FFC, with about a score of them accounting for nearly 80% of all purchases.

Meanwhile, FFC states that it is keeping a "careful eye" on all orders. It believes that it can take care of small customers and sees no difficulty in maintaining a normal working inventory and servicing of the trade during the balance of the program.

Status of Baytown Plant

According to reports from Washington, D. C., the House Armed Services Committee was to have held a hearing on March 10 on the bill providing for the sale of the Baytown, Texas, GR-S plant now operated by the General Tire & Rubber Co. of Akron, Ohio.

Chairman Vinson (Dem., Ga.) said the bill would be changed to give the Rubber Producing Facilities Disposal Commission authority to sell the government plant in whatever period of time is deemed necessary. He said that special arrangements for the Baytown plant will not upset the disposal of other plants.

Representative Vinson's support probably assures passage of the Baytown bill, which was sponsored by Representative Albert Thomas (Dem., Texas). The original bill would give the General Services Administration the right to sell the plant. The Baytown GR-S plant went unsold when General Tire, the only bidder, failed to meet the Disposal Commission's price.

A Senate Banking subcommittee was also scheduled to open a three-day hearing on March 8 on the proposed sale of the government-owned synthetic facilities. The opening day was to have been set aside for testimony on a bill to reopen negotiations for the Baytown plant. Asked to testify on the bill were Senators Price Daniel and Lyndon B. Johnson, Texas Democrats; Chairman Holman D. Pettibone of the Rubber Producing Facilities Disposal Commission, and Laurence E. Robbins, Administrator of the Federal Facilities Corporation.

The subcommittee also asked Comptroller General Campbell to appear to report his findings on whether the Disposal Commission set a high enough price for the facilities. Also slated to testify were Justice Department witnesses, who gave anti-trust law clearance to the sales program. The Senators also invited testimony from U. S. Rubber, Goodrich-Gulf Chemicals, Goodyear, Firestone, Esso Standard, Shell Chemical, and Minnesota Mining and Manufacturing Co.

H. P. Buetow, president of Minnesota Mining, had previously written to Banking Committee Chairman William Fulbright (Dem., Ark.) that the Disposal Commission should be required to set aside a contract for the sale of three West Coast plants to Shell Chemical, and call for new bids.

Shell, in entering a "package" bid for the three plants, failed to assign a specific offering price to each of the three. Mr. Buetow, whose firm entered a bid for one of the three facilities, said this procedure made it impossible to outbid Shell during subsequent negotiations.

There were some unconfirmed reports preceding the hearings that some opposition to the Daniel-Johnson bill may develop from firms purchasing other GR-S plants. Subcommittee Chairman J. Allen Frear (Dem., Del.), stated that the hearings were open to anyone with "specific objections" to the proposed sales.

Congress has until March 25 to act on the sales contracts. Unless it decides to veto, the sales take effect in thirty days from that date.

Rubber Research Program

In its recent report to Congress, the Rubber Producing Facilities Disposal Commission recognized that with the transfer of the synthetic rubber facilities to private industry, serious problems relative to the continuance of the government's rubber research program remain. For the past several years, two agencies of the government have been carrying on extensive rubber research activities: (1) the Office of Synthetic Rubber, and (2) the Department of Defense.

The report stated that in view of the

interest of the Department of Defense in rubber research, it might appear logical that the Department take over the program now being conducted by the Office of Synthetic Rubber and combine it with its own. However, the interest of the government in this program goes far beyond the problems of the Department of Defense, important though they may be.

In the opinion of the Commission, better results might be achieved if the government's rubber research program were placed in the hands of a competent group, with complete responsibility not only for the operation of the program but for the determination of its scope, size and general direction. Such a group, stated the report, should include a number of outstanding scientists not otherwise connected with the government, who would be competent to evaluate the program objectively and determine to what extent it should be expanded, contracted, or eliminated.

National Science Foundation Act

In its exploration of the possibility for such a program, the Commission considered a statute enacted by the Congress in 1950 (Public Law 507, 81st Congress), known as the National Science Foundation Act of 1950. Among the functions of the Foundation as defined in the statute, are the following:

(1) To develop and encourage the pursuit of a national policy for the promotion of basic research and education in the sciences.

(2) To initiate and support basic scientific research in the mathematical, physical, medical, biological, engineering, and other sciences, by making contracts or other arrangements (including grants, loans, and other forms of assistance) for the conduct of such basic scientific research and to appraise the impact of research upon industrial development and upon the general welfare.

(3) At the request of the Secretary of Defense, to initiate and support specific scientific activities in connection with matters relating to the national defense by making contracts or other arrangements (including grants, loans, and other forms of assistance) for the conduct of such scientific research.

(4) To evaluate scientific research programs undertaken by agencies of the federal government, and to correlate the Foundation's research programs with those undertaken by individuals and by public and private research groups.

(5) To establish such special commissions as the Board may from time to time deem necessary for the purposes of the act.

A review of this statute and inquiry as to the work now being done by the Foundation led the Disposal Commission to conclude that the Foundation appears to be well equipped and able to function in connection with the government rubber research program.

In an announcement in early February, the National Science Foundation agreed to accept governmental responsibility through fiscal 1956 for the federal rubber research program. Alan T. Waterman, director, indicated that the Foundation will, as soon as possible, enlist the aid of expert scientific and technical advice in making a thorough review and evaluation of the existing research programs.

It is to be noted that the rubber research program currently administered by the Office of Synthetic Rubber covers four separate phases: (1) An Industry Program; (2) A Tire Testing Program; (3) A basic research program conducted by contract with nine educational institutions and three research organizations, and (4) A laboratory owned by the government at Akron, Ohio, and operated under a contract with the University of Akron.

With reference to the over-all program, the Disposal Commission made the following recommendations:

(1) The Industry and Tire Testing Programs should be discontinued upon transfer of the plants.

(2) The Office of Synthetic Rubber should carry on the Universities and Institutes Program, and operation of the government laboratory, through June 30, 1955.

(3) The program conducted through universities and institutes, and the government laboratory operated by the University of Akron, should be continued substantially as they are, under the supervision of the National Science Foundation, for a trial period running through fiscal 1956.

The Disposal Commission also stated that it should be the function of the National Science Foundation not only to provide supervision and management of the rubber research program, but to screen all projects undertaken and to review and appraise all reports submitted in order to evaluate the results of the programs. In the event it should appear to the Foundation at any time that the program is not necessary, it should recommend its discontinuance.

As to the government laboratory operated by the University of Akron, the Disposal Act specifically states that it should not be sold. The Disposal Commission believes that its contribution to any post-disposal research program as a testing laboratory and pilot plant must be determined before any decision is reached.

Average Mileage Increases

Average American families are putting 700 miles more a year on the family car than they used to do 15 years ago, according to a study made by the Business Research Department of the B. F. Goodrich Co., Akron, Ohio. In that period, American families have increased their average road mileage from 8,800 to 9,500 miles. The study revealed that in terms of average family income, automobile tires are a better buy now than ever before. While average family incomes increased nearly 200% since 1940, replacement tire costs rose less than 25%. Today, families pay less each year to replace worn out tires than they spend on annual purchases of tobacco. In driving 9,500 miles today, according to Goodrich, 1.4 tires, valued at $41.43, are worn out. This is less than three-quarters of one percent of family annual income. In traveling 8,800 miles in 1940, about one and three-quarter tires, costing $33.44, were worn out. Fifteen years ago, the proportion of the family income going for tires was two and one-half times larger than the present figure.

Natural Rubber Stockpile

Another area of involvement of the government in the rubber industry comes in the field of natural rubber, and here, on February 16, it was announced by the General Services Administration that the government's stockpile of natural rubber will be rotated under new regulations.

Under the new regulations, superseding those announced May 4, 1954, the ceiling on upgrading will be increased from 5,000 to 7,500 tons per month. In addition, the new regulations extend the time within which purchases of rubber from the stockpile must be replaced. Under old rules, rubber ordered from the stockpile during a current or succeeding month had to be replaced, pound for pound, within one month after delivery.

This period proved too short to permit suppliers to order replacement material from Far Eastern producing areas. Manufacturers and dealers were unwilling to participate in the rotation program except on a "fill-in" basis that did not provide the volume of transactions necessary to keep the stockpile from deteriorating. Therefore, the new regulations provide that rubber ordered for delivery from the stockpile during the current or first succeeding month may be replaced at any time within two months of delivery.

No change was made in the requirement that rubber ordered for delivery during the second succeeding month must be replaced within one month, while that ordered for delivery during the third succeeding month must be replaced in the same month.

Maximum Quantity Movement

Increasing the rotation rate to at least 7,500 tons per month has as its objective the movement of a maximum quantity of deteriorating material out of the stockpile before the summer of 1956, summer being the season of most rapid deterioration. If it should prove possible to rotate quantities above 7,500 tons a month, the additional rubber will not be upgraded but will be replaced temporarily with one or more of the lower grades of rubber.

GSA said that a ceiling is imposed on upgrading in order to minimize the market effect of rotation. If the government were to sell an unlimited quantity of the lower grades, and were to buy back only the higher grades, the differentials between grades would widen abnormally. This could have a disturbing effect in the Far East, since in general the better materials

are produced by large estates and the lower grades by smallholders.

A. J. Walsh, Commissioner of Emergency Procurement Service, pointed out that it is not possible to predict exactly how the new regulations will operate since rotation is influenced by a number of factors over which the government has no control. He listed some of these as the total demand for rubber in this country and abroad, the demand for natural rubber as opposed to synthetic, available supplies of both, and the price of various grades of natural. "However," he said, "we have consulted fully with many government agencies involved, such as the Office of Defense Mobilization and the Department of State.

"Before formulating the new regulations, we sought the advice of GSA's Rubber Advisory Committee, representing importers and consumers of natural rubber. Other governments interested in natural rubber also were advised through the Management Committee of the International Rubber Study Group."

Effect on World Markets

E. F. Mansure, General Services Administrator, said that other countries and trade and industry were consulted because of GSA's long standing determination to manage the rubber stockpile with a minimum effect on world markets.

Grades of stockpile rubber now on hand range from 1-X ribbed smoked sheet, which will store without deterioration for upwards of 20 years, to flat bark, which deteriorates after approximately one year in storage.

Mr. Mansure did not announce a figure of total rubber holdings in the stockpile. "However," he said, "our total objective has been reached in terms of quantity and we can now concentrate on reaching the final objective in terms of quality. We will maintain a constant review of rotation activities to minimize deterioration, to eliminate or minimize effects on the rubber market, and to maintain the rubber stockpile at the lowest possible cost to the government."

Natural Usage Increases

World production of natural rubber in 1954 totaled 1,802,500 long tons, up 4.5% from the 1953 figure of 1,725,000 long tons, according to estimates of the Secretariat of the International Rubber Study Group. This made 1954 the third largest production year, being surpassed only by 1950 with 1,860,000 long tons and 1951 with 1,885,000 long tons.

World consumption of natural rubber in 1954 hit a new high of 1,725,000 long tons, an increase of 6.8% over the 1,615,000 long tons posted in 1953. The old mark was 1,705,000 long tons, set in 1950. Imports of natural rubber into Russia in 1954 were set at 425 long tons, while Red China is said to have imported 62,250 long tons. The two countries together imported 101,850 long tons in 1953.

World stocks of natural rubber at the end of December, 1954, were placed at 877,500 long tons, consisting of 285,000 long tons in producing countries, 387,500 long tons in consuming countries (excluding Russian and Chinese stocks and government stocks in the U. S., U. K., and France), and 205,000 afloat. Stocks at the end of 1953 totaled 830,000 long tons.

ARMSTRONG RUBBER CO. ANNOUNCES ELECTION OF THREE VICE-PRESIDENTS

J. A. Walsh, Jr.

F. E. Buddenhagen

C. E. Rueckert

Three new vice-presidents were elected at the recent annual meeting of the board of directors of the Armstrong Rubber Co. of West Haven, Conn. The new officers are James A. Walsh, Jr., factory manager of Armstrong Rubber at West Haven; Frederick E. Buddenhagen, member of the research and development staff at West Haven, and Charles E. Rueckert, general manager of the Armstrong-Norwalk Rubber Corp., Norwalk, Conn. Mr. Walsh is a graduate of Yale University. In 1942, he was employed by Armstrong as manager of scheduling. Prior to being named factory manager at West Haven in 1951, Mr. Walsh held the positions of employment manager, assistant to the chief engineer and purchasing agent. Mr. Buddenhagen joined Armstrong Rubber in 1948 as a development project engineer. A graduate of Colgate University, his first position was with the Firestone Tire & Rubber Co. where he spent five years in sales organization and six years in the Development Department. As a member of Armstrong Rubber's research and development staff, he is responsible for the development, construction and design of new tires. Mr. Rueckert, a graduate of the University of Chicago, was first employed by Armstrong Rubber in 1944. He gained experience in scheduling, industrial engineering, research and development and sales service departments prior to his appointment as assistant to the vice-president in charge of production in 1949. In 1951, he was appointed general manager of the Armstrong-Norwalk Rubber Corp., the position he holds today.

FTC Discount Case Scheduled

Another step in the legal battle by tire companies to kill a Federal Trade Commission ceiling on quantity discounts was to have been taken in mid-March at the federal district court in Washington, D. C., with the filing of a government motion for a summary judgment. Albert Parker, U. S. Justice Department attorney, said that the case would be heard in mid-April. The government motion seeks dismissal of the companies' case against the FTC rule limiting discounts on tires and tubes to no more than the amount available to one-carload purchasers. The tire companies and a number of their important customers, including oil companies and mail order houses, have agreed to consolidate their cases for the fight on the motion. They declined to accept the government's view that proper procedure has been followed by FTC and that the case should be decided merely on whether the discount rule is legal. The companies argued that such factual questions as discounts offered on private brand tires to oil firms which perform market functions also should be considered. The case had previously been before district and appeals courts on the government's contention that the companies could not ask for relief in court until they actually suffered damage.

FFC Announces X-769

The Federal Facilities Corporation, Washington, D. C., has announced that in response to numerous requests for a non-staining FEF black masterbatch to replace the slightly staining GR-S 1104, the number X-769 has recently been assigned to such a masterbatch. X-769 will be the same as GR-S 1104, except that the base polymer is a fatty acid emulsified cold rubber and contains a non-staining instead of slightly staining antioxidant. X-769 is described as follows: "50 parts fast extrusion furnace black plus 100 parts low temperature polymerized base polymer—approximately 23.5% bound styrene, fatty acid soap emulsified, sugar-free iron activated, carbamate shortstopped, non-staining stabilizer Polygard or equivalent, salt-acid coagulated. Mean Mooney of masterbatch (compounded) approximately 47 ML-4 at 212°F." Evaluations of pilot plant samples indicate that X-769 will have higher tensile strength, better flex life and resilience and will extrude at a faster rate than GR-S 1104. Breakdown and mixing characteristics are comparable to GR-S 1104. FFC believes that X-769 will be of special interest in molded and extruded mechanical goods and calendered sheet applications and should be evaluated as a replacement for GR-S 1104 in these applications. At the end of six months' evaluation period, if consumers' findings are favorable, the FFC will abolish GR-S 1104 and assign a permanent number to X-769. If consumers' evaluations are unfavorable, X-769 will be abolished.

NATIONAL SAFETY COUNCIL RUBBER SECTION HOLDS INTERESTING MEETING

The Rubber Section of the National Safety Council met in Chicago, Ill., on October 19 and 20, in conjunction with the 42nd National Safety Congress which was held from October 18 through 22. A feature of the Rubber Section meeting was a round table discussion on "Safety in the Rubber Industry", held in the afternoon of October 20. The round table discussion was divided into four separate sections.

The first section covered "Synthetic Rubber and Rubber Laboratories". This portion of the discussion was presided over by K. B. Davis (Goodrich Chemical), while F. T. Reynolds (Government Laboratories—Akron University) served as conference recorder. The discussion developed half a dozen recommendations for meeting common laboratory safety problems and suggestions for new Section activities. The problem of handling solvents and laboratory equipment was discussed.

It was suggested that a specific manual for each laboratory be used. Several manuals were recommended, among them the National Safety Council's Safe Practices Pamphlet No. 60, "Chemical Laboratories," and the RFC Manual.

It was also recommended that eye protection of some form be used and that special areas for smoking be set aside if they are not already. Most plants do have such areas.

The definition of chemicals is also another problem in most plants. The purchasing department should get information on the toxicity of all new materials to be used and the receiving department should be kept informed of this suggestion.

There were two suggestions for expansion of Section and Council activities. It was urged that the Council encourage the exchange of ideas about associated industries. Reference was made to the synthetic rubber industry's program in Washington.

It was also suggested that safety should be incorporated in the laboratory training of college students. The National Safety Council is the obvious choice to sponsor such training.

Second Part of Meeting

The second portion of the meeting concerned itself with "Automatic Fire Press Safety". Edward Turner (Goodyear) presided, with W. M. Graff (U. S. Rubber) as conference recorder. The first subject of discussion was Bagomatic press safety. Bags burst under pressure and operators are burned with scalding water.

Operators are caught in closing presses. While the presses do have a safety bar to prevent the press from closing if someone is in it, the consensus was that since the danger is so great, regular inspection and testing of the safety devices should be done. It is not enough to just trip the brake, the entire mechanism should be checked by a mechanic.

Sometimes, operators try to beat the standard by cutting down on the time cycle. It should be an established rule that is strictly enforced that all operations in the cavity of the press must be completed before the cycle is started. The use of portable extension cords to permit the opening of stuck presses from a distance was also reported and recommended.

"Handling of Heavy Tires" was the subject of another discussion at the round-table meeting. George H. Burkhardt (General Tire) presided over this discussion and D. M. Carson (U. S. Rubber) acted as conference recorder. Large size tires were defined as those weighing 1,400 to 3,600 pounds. These tires usually have a diameter of 10 to 12 feet.

The main hazards revolve around tires sticking in presses and the handling of the very bulky tires after curing. When tires stick in the presses, the operators may strain themselves or slip as they try to pry the tires out. It is hazardous to use the average hoist in getting tires out of the press because of the chance of overloading the hoist or cable. It is more practical to use the motor power of the press to pull the tire loose from the mold. It is bad practice to twist the chain because you put undue stress on some portion of it this way. It is better to use a wire rope sling.

General Tire Handling Truck

A new handling truck was evolved by General Tire which gets away from the use of fork lift trucks and will handle the tire all the way from curing to debagging to painting, trimming, inspection and finally to the box car. Transporters are used to handle the special trucks and there should be strict rules against anyone riding on the transporters.

Training, selling, and if necessary, discipline were emphasized as methods of insuring observance of safe practices. A member of the discussion group who is a union representative remarked upon the necessity for training people to do what looked like extremely simple jobs.

C. E. Beck (St. Clair Rubber) presided over the next discussion, entitled "Mechanical Rubber Goods Safety", and Arthur R. Pomeroy (Ohio Rubber) served as conference recorder. The discussion group talked about several problems and mentioned the apparent lack of cooperation of workers with the safety program, the problem of industrial noise, the problem of back strain as in moving molds, and the problem of guarding punch presses. The possibility of a device operated by air to take over heavy lifting was suggested.

One unsolved problem is that of guarding the rolls by which rubber coating is applied to V-belts, the discussion group decided.

One of the papers presented at the two-day Rubber Section meeting was entitled "Recent Development in Calender Safety" by Nelson C. Longee of the U. S. Rubber Co., Passaic, N. J. In his paper, the speaker discussed guards versus rescue devices, hazards and control ideas, guarding the bite, let-off and wind-up hazards, starting the wind-up and measuring the value of safety devices.

We should never forget, said the speaker, that the job is prevention of accidents, not the explanation of injuries. At U. S. Rubber's Passaic plant, Mr. Longee declared, most of the original "safeties" are looked upon as "rescue" devices and treated as what they are—temporary guards to be constantly watched and replaced by real guards which will: (1) Make the hazard inaccessible; (2) Make the machine inoperative when a guard is out of place, or (3) Make the operator error cause the machine to fail safe.

Other papers presented at the Rubber Section meeting included the following:

"Creating Top Management Interest in Safety" by Glen D. Cross, Firestone Tire & Rubber Co., Akron, Ohio.

"Using Contests to Get Participation in the Safety Program" by M. R. Batche, Xylos Rubber Co., Akron, Ohio.

"Encouraging the Wearing of Protective Clothing" by Alfred E. Bernel, Firestone Steel Products Co., Akron, Ohio.

"Housekeeping and Safety Inspections" by Frank C. Starbird, Firestone Tire & Rubber Co., Akron, Ohio.

"Safety Meetings and Other Safety Training" by D. M. Cornell, Firestone Tire & Rubber Co., Akron, Ohio.

"The Wooster Rubber Company Safety Program" by Grant E. Rose, Wooster Rubber Co., Wooster, Ohio.

Joins Smith and Scherr

Bernard A. McDermott, formerly director of art and product design for the Sun Rubber Co., Barberton, Ohio, has joined the firm of Smith and Scherr, industrial designers of Akron, Ohio, as a full partner. Effective March 1, the firm name will be Smith, Scherr, and McDermott, Designers. At the same time, it was announced that the firm of Vyn-L-Mold and Development Corp., at 279 N. Forge St., Akron 4, Ohio, has been formed by the Messrs, Smith, Scherr and McDermott so that a complete service, from the idea stage through design, packaging, mock-ups, and sample runs could be available to manufacturing or sales organizations. The two firms will work collaboratively on all re-design or new product developments.

Akron Group Plans Symposium

The April 1 meeting of the Akron Rubber Group, to be held at the Mayflower Hotel in Akron, Ohio, will feature a panel discussion on "Textiles and the Rubber Industry." The panelists will include experts from the Akron rubber companies and major suppliers to the rubber industry. The primary purpose of this symposium is to discuss the broad use of textiles in the rubber industry rather than the chemistry of the fibers involved. The speaker at the non-technical portion of the meeting will be James Farley, vice-president of the Coca-Cola International Co.

Appointed Chief Engineer

Francis A. Dunnington has been appointed chief engineer of the Restfoam Division of Hewitt-Robins Inc. at Buffalo, N. Y. A native of Niagara Falls, Ont., Canada, Mr. Dunnington is a graduate of the University of Virginia. He joined Hewitt-Robins in 1950 as an engineer and in 1952 was appointed plant engineer. Mr. Dunnington is a member of the American Society of Mechanical Engineers and the Buffalo Yacht Club.

HOLT ADDRESSES AKRON GROUP ON RUBBER OUTLOOK FOR 1955

Everett G. Holt, assistant director for Rubber in the Chemical and Rubber Division of the Business and Defense Services Administration, U. S. Department of Commerce, Washington, D. C., delivered an interesting talk before the January 20 meeting of the Akron Chamber of Commerce, Akron, Ohio. Mr. Holt spoke on the subject, "Outlook for 1955, Natural and Synthetic Rubber."

In his remarks, the speaker made brief reference to matters of Chemical and Rubber Division organization, publications and activities. He indicated that American manufacturers are consuming rubber at a rate that holds the promise that first quarter usage in 1955 may reach the record set in the first three months of 1953.

The situation in the following months may not be so bright, with a great deal depending on the second quarter labor situation in the automobile industry. The threat of a strike hangs over the major automobile concerns as the union pushes its demands for a guaranteed annual wage. A work stoppage would halt demand for tires and tubes that is now keeping plants humming.

Mr. Holt stated that this country may find it difficult to get as much natural rubber in 1955 as it did in 1954, when about 600,000 long tons were consumed. He discussed the rise in natural rubber prices and expressed some degree of puzzlement as to why manufacturers have not switched from natural to synthetic more rapidly in view of the price situation.

Question of Time Lag

On this question of "lag" in switching from natural to synthetic, Mr. Holt stated that while free choice of materials means freedom from government dictation over consumption, some consumers may have misinterpreted this concept to imply an ample supply of all rubbers. In fact, he said, the supply of each type has limitations.

Higher prices will not necessarily bring out ample supplies of natural rubber in a period of high consumption, Mr. Holt observed. There is no central responsibility for keeping consumption in balance with supply. If the aggregate free choice of the companies result in demand in excess of supply, everybody is affected. Each company is guided in its own choice of materials by the supplies it has arranged for and their relative prices.

It is worth noting, the speaker stated, that in October, the declared value per pound of all the natural rubber (dry and latex) imported into this country was 22c a pound. Therefore, large users in November were presumably using natural rubber that cost them less than synthetic. The industry usually shifts from synthetic to natural, and vice versa, gradually—a few decimal points per month.

The industry ought to be able to come up with some formula for shifting several full percentage points promptly, when occasion makes it necessary, either way, both to be prepared against emergencies and to be protected against economic fluctuations. This would involve, obviously, large shifts in the type of rubber used in tires.

In touching upon other points of interest to the rubber industry, Mr. Holt stated that he is one of those who feels the disposal program will go through without Congressional interference. He also sees only a mild increase in the price of synthetic rubber when private industry takes over and the new owners may even delay this action. In his opinion, the number of types of synthetic rubber which will be offered to consumers will be reduced when the plants are sold.

Mr. Holt also observed that there is no chance that the government will dispose of any of its natural rubber stockpile this year. He added that high yielding rubber plantations have nothing to fear in competition with synthetic. Every acre planted today in high yielding trees produces as much as three or four acres of older variety.

GOODRICH CHEMICAL NAMES THREE NEW PLASTIC PRODUCT SALES MANAGERS

W. D. Lahey

E. B. Osborne

H. L. Wuerth

B. F. Goodrich Chemical Co., Cleveland, Ohio, has announced the appointment of three new plastic product sales managers: W. D. Lahey, manager of extrusion and molding materials; E. B. Osborne, manager of calendering and coating materials, and H. L. Wuerth, manager of wire and cable materials. They will all report to G. A. Fowles, manager of plastic materials sales. All three men, former sales representatives, have moved into the Cleveland, Ohio, area from Goodrich Chemical offices in other states. Mr. Lahey came from Chicago, Mr. Osborne from Philadelphia and Mr. Wuerth from New York City.

Mr. Lahey received his B.S. in chemical engineering from Purdue in 1939, and an M.S. in business administration from Harvard Business School in 1941. He then worked for Eastman Kodak in production control for a year and was with the Naval Ordnance Laboratories in Washington, D. C., during World War II as an industrial engineer. He joined Goodrich Chemical in 1945 as a chemical engineer in Cleveland, and has worked in New York and Chicago since then as both a technical and sales representative.

Mr. Osborne was graduated from Illinois College with a B.A. in chemistry in 1941, and he received an M.S. in chemistry in 1943 from the University of Wisconsin. He started with the parent organization in Akron, after graduation, as a technical man, holding various jobs there before being transferred to Goodrich Chemical in 1946 as a chemical engineer. After holding several sales positions in Cleveland and New York City, he was sent to Philadelphia in 1952, where he started the operation of a new Goodrich Chemical branch office. Mr. Osborne is a member of the Society of Plastics Engineers, Society of Plastics Industry, and the American Chemical Society.

Mr. Wuerth, the new manager of wire and cable materials, received his bachelor of chemistry and chemical engineering degree from Cornell University in 1937. He joined Anaconda Wire and Cable Co. after graduation, and in 1946 came to Goodrich Chemical in Cleveland as a technical service engineer on wire and cable covering. He was transferred to New York as a sales representative in 1947. He is a member of the Armed Forces Chemical Association, New York Rubber Group, Division of Rubber Chemistry of the American Chemical Society, and the Cornell Society of Engineers.

S. O. Development Changes Name

On February 3, the Standard Oil Development Co. of New York, N. Y., changed its name to the Esso Research and Engineering Co. The firm is the Standard Oil Co. (New Jersey) affiliate responsible for petroleum research and engineering in this country and abroad. One of its major facilities is the Esso Research Center, Linden, N. J. The company said its new name was intended to provide better identification and to describe more accurately its expanded activities. Originally a Jersey Standard department, the firm became a separate corporation in 1922. More than $40,000,000 is spent yearly by the company currently in research and engineering on petroleum and refinery processes.

Bastian-Blessing Co., Chicago, Ill., is manufacturing a new carbonator with a re-designed impeller made from a Pliovic-rubber compound.

RUBBER TRADE ASSOCIATION CELEBRATES 40th ANNIVERSARY

The Rubber Trade Association of New York, Inc., held its 40th Anniversary Dinner on February 24 at the Hotel Biltmore in New York City. The dinner, attended by approximately 300 members and guests, was dedicated to six "elder statesmen," all of whom have passed their golden anniversary in the rubber business. The six, three of whom were present, included Frank B. Ross, R. L. Chipman, Robert Badenhop, James C. Baldwin, Herman Muehlstein and Marcus Rothchild. Special gifts in commemoration of the occasion were presented to each in person or in absentia.

The address of welcome was given by R. D. Young, president of the Association, who also functioned efficiently as toastmaster. Mr. Young introduced the nineteen people seated on the dais, several of whom gave extremely brief talks. At the request of F. H. Jackson, executive of Hecht, Levis & Kahn and chairman of the board of the Association, a moment of silence was observed for the late Paul Shafer, frequently referred to as the "father" of rubber legislation.

Willis Armstrong, of the State Department, who functions as an official American delegate at the meetings of the International Rubber Study Group, thanked the members of the Association for their cooperation on all matters pertaining to natural rubber. Russ Blandford, counsel to the House Armed Services Committee, made brief mention of the progress in transposing the government-owned synthetic rubber production facilities to private industry. Jim Sears, vice-president of the Rubber Manufacturers Association, remarked on the cooperation which has long existed between the R.T.A. and R.M.A. and referred to 1955 as being "an historical year for the rubber industry."

Mr. Young also introduced a number of guests who were present at the dinner. These included E. G. Holt (Commerce Department), E. D. Kelly (Office of Synthetic Rubber), O. V. Tracy (Standard Oil), W. S. Lockwood (W. S. Lockwood & Associates), H. C. Bugbee (Natural Rubber Bureau), C. C. Miller (Rubber Manufacturers Association), A. H. Wolf (National Resources Board), and the editors of the two domestic rubber journals.

In connection with the dedication of the dinner to the Association's "elder statesmen," Mr. Young pointed out that the Association included in its membership some 65 men who each had more than 35 years of experience in the rubber trading field. As for the Association itself, it includes 31 company members in its Dealers' Group and 24 in its Brokers' and Agents' Group. The "senior statesman" is Mr. Ross, who started his activities in the trade in 1897.

Celanese Introducing New Fiber

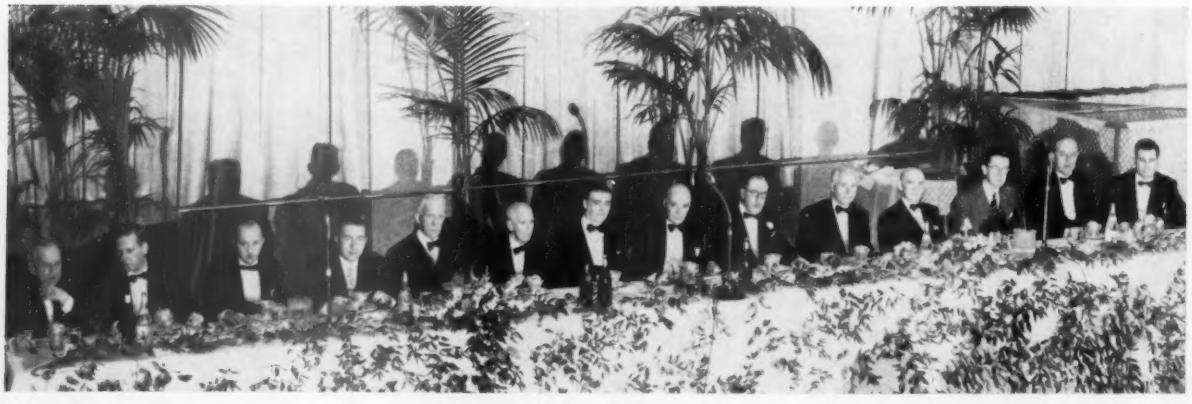
Celanese Corporation of America, New York, N. Y., will begin full-scale commercial production of "Fiber X-36," a superstrong industrial fiber, before the end of 1955, according to a recent announcement. Fiber X-36 has been under development and evaluation for the last four years. Equipment and machinery are now on order for the operation which will be located at the Rome, Ga., fiber manufacturing plant of the company. The company states that although Fiber X-36 is a chemical brother to "Fortisan," the regenerated yarn which Celanese launched in 1940, it is made by an entirely new and different process developed specifically for the production of the heavy deniers required in industrial applications. The product will be marketed as "Fortisan 36" in continuous filament form, and at the outset will be available in 800 denier continuous filament. Other sizes in the heavy denier ranges may be produced. In the process of appraising the market opportunities for Fortisan 36, the fiber has been evaluated by a large number of corporations operating in various fields. Reports from these consumers indicate a bright potential for the material, the company states, due to its properties of great strength, low elongation and dimensional stability in such fields as power transmission belting, high pressure hose, fire hose, conveyor belts, webbing, body armor and backing for heavy duty carpets. Broadly, the company notes, the new product tends to fill a gap which now exists between high tenacity rayon on one side and glass fiber and industrial steel wire on the other.

Advance Introduces Advawet X-212

Advance Solvents & Chemical Corp., New York, N. Y., has introduced "Advawet X-212", developed specifically for vinyl plastisol formulations to reduce the viscosity of plastisols having a low plasticizer resin ratio. It is particularly intended for plastisols containing a large amount of fillers or pigments. With a specific gravity of 0.984 at 20°C., the product is 1 - 2 G.H. in color and has a viscosity of 20 - 25 cp. at 25°C. It weighs 8.2 pounds per gallon and has a refractive index of 1.4528 at 20°C. The company states that Advawet X-212 not only reduces the viscosity of plastisols but it also lowers the interfacial tension between plasticizer and air bubbles and, therefore, aids in removing entrapped bubbles from the plastisol. In deaerating plastisols it will reduce the tendency of bubble formation during casting in the molds, and air bubbles formed will burst easily. Advawet X-212 will also aid in reducing viscosity and removal of air bubbles in plastisols prepared with high viscosity or polymeric plasticizers. The company recommends a dosage of 1 - 2% Advawet X-212 based on the total weight of the plastisol.

Reliance Acquires Reeves

Reliance Electric & Engineering Co., Cleveland, Ohio, has negotiated for the acquisition of the Reeves Pulley Co. of Columbus, Ohio. Under the conditions, the two companies will merge operations in exchange for Reliance common stock and cash, the Reeves shareholders thereby becoming partners and substantial stockholders in Reliance. Starting fifty years ago as an electric motor manufacturer in Cleveland, Reliance today also has plants in Euclid and Ashtabula, Ohio, and a subsidiary company in Canada. It is a major producer of electric motors and electronically controlled drive systems. Reeves is a leading manufacturer of infinitely variable speed transmissions and mechanical vari-speed drives. It is a large user of electric motors such as manufactured by Reliance. The management at Reeves will remain intact and it will continue as a separate division of Reliance. Combined assets of the two companies will exceed $25,000,000.



This photograph shows officers, directors and guests of the Rubber Trade Association of New York at the recent 40th Anniversary Dinner in New York City. Also seen are three of six "elder statesmen" of the rubber industry who were honored on the occasion.

U. S. PLANNING TO APPEAL DISMISSAL OF DUPONT SUIT

According to an announcement from Washington, D. C., the government will appeal the dismissal of the anti-trust suit against the DuPont interests and the General Motors Corp. Attorney General Brownell announced on February 4 that the Justice Department had filed its notice of appeal to the Superior Court in Chicago, Ill., where Federal Judge Walter J. LaBuy dismissed the suit last December 3.

The court held at that time that the government had failed to prove its charges of monopolistic and restraint-of-trade practices. Besides the DuPont interests and General Motors, the court also absolved the U. S. Rubber Co. and thirty-two members of the du Pont family. The Justice Department, however, apparently has decided not to reopen this phase of the case.

The DuPont interests involved are E. I. du Pont de Nemours & Co., Inc., the Christiana Securities Co. and the Delaware Realty and Investment Co. The government charged that the latter two companies had voting control of the DuPont company. The government seeks to force DuPont to sell its 20,000,000 shares of General Motors stock. It contends the stock was purchased to establish a monopolistic market for DuPont products.

Crawford H. Greenwalt, president of DuPont, commented he hoped the "clear-cut vindication" of the company and the other defendants by Judge LaBuy "would have convinced the Department of Justice no further continuance of this already protracted litigation was necessary."

Suit First Filed in 1949

The government first filed its suit in June, 1949, and the trial opened in Chicago on November 18, 1952. In all, more than 1,000 exhibits were offered by the defense, and forty-three witnesses testified for it. The government called six witnesses and offered 1,400 exhibits. The record of the trial fills thirteen volumes.

In its notice appeal, the government said that Judge LaBuy had "erred" in failing to conclude that DuPont had "effective working control of General Motors throughout the period covered by the government's complaint." This "control," it said, began with the acquisition in 1918 by DuPont of 23% of the outstanding capital stock of General Motors and continued with ownership of at least a percentage of such stock. DuPont officials, the government held, permeated the top echelon of General Motors' management.

Moreover, the government said, it feels the judge erred in failing to find that DuPont's stock interests in General Motors and active participation by DuPont representatives in General Motor's Management "gave DuPont a preference over its competitors in the sale of products to General Motors."

The government contended this "preference" extended to the sale of commercially valuable chemical products discovered by General Motors, "with resulting restraint of trade of DuPont's competitors".

DuPont and General Motors, the government alleged, therefore constitute a "combination in restraint of interstate trade" in violation of the Sherman Anti-Trust Act. It also charged violation of the Clayton Act, which prohibits acquisition of stock by a corporation to eliminate competition. The government asked that the high court require DuPont to divest itself of all General Motors stock.

TWO NEW SALES REPRESENTATIVES APPOINTED BY GOODRICH CHEMICAL

H. E. Minnerly

G. S. Ramsey

Two new Hycar and rubber chemicals sales representatives have been named by the B. F. Goodrich Chemical Co., Cleveland, Ohio. H. E. Minnerly has been named to represent the company in the Chicago, Ill., area, while the new representative in the northern New York area is G. S. Ramsey. Mr. Minnerly was formerly a product engineer in the Rubber Chemicals Sales Department and prior to that a development engineer at the company's Avon Lake, Ohio, experimental station. He joined the B. F. Goodrich Co. in 1949 and transferred to Goodrich Chemical in 1951. A graduate of Yale University in 1949 where he received a B. E. in chemical engineering, Mr. Minnerly is a member of the Akron Rubber Group and the American Chemical Society.

A new employee at Goodrich Chemical, Mr. Ramsey joined the company after five years as chief chemist at the Grove Regulator Co. of Oakland, Calif. Mr. Ramsey attended Oregon State College and the University of Oklahoma and was graduated from the latter school in 1944 with a B. S. in chemical engineering. He is a member of the Division of Rubber Chemistry, ACS, and the Northern California Rubber Group.

Another Street Rubber-Surfaced

Rubarite, Inc., Akron, Ohio, has announced the completion of a re-surfacing job on major business streets in Rapid City, S. D. The new material used in the program is called "Rubarite", a free-flowing powder made of unvulcanized synthetic rubber and barytes mineral. Rubarite was mixed with asphalt and then spread in an average of one and one-half inch thickness across 10 of the city's main streets. A test patch of the asphaltic material was installed last year and studied through the winter of 1953-54 before it was decided to go ahead with the project just completed. An evaluation of the patch by local authorities this spring showed that 90% less cracking had developed compared to other re-surfaced streets. Rubarite is being produced in Magnet Cove, Ark., by Rubarite, Inc. Rubarite, Inc., is jointly owned by the Goodyear Tire & Rubber Co., the National Lead Co., and Bird & Son, Inc.

Farm Rib Tractor Tire

Ease of steering and greater flotation are said to be outstanding features of a new, popularly-priced farm tire announced by the Goodyear Tire & Rubber Co., Akron, Ohio, for the front wheels of tractors. Known as the "Farm Rib", the new tire is designed primarily for the replacement market. It succeeds the former "Marathon" in the company's line, and offers several distinct advantages over its predecessor, Goodyear states. Constructed with three continuous ribs around the tread, the new tire is easier steering. It also has a wider tread for improved flotation in either sandy or heavy soil. Tread wear has been improved, it is pointed out, through the use of wider ribs and tough, long-lasting rubber compounds. Durability likewise has been further increased by the tire's husky, high tensile beads, holding it securely on the rim. The Farm Rib, according to the company, is designed as a companion unit to the "Sure Grip" tire, the "D-15", a popularly-priced replacement tire for rear wheels of tractors. Made in all popular front tire sizes, the new Farm Rib incorporates an additional size not previously available in its predecessor, 4.00—19. Complete sizes range from 4.00—15 through 6.00—16.

Tired of waiting for this copy of RUBBER AGE to reach your desk? Use the coupon on page 961.

CURTISS-WRIGHT INTRODUCES NEW PRODUCTS AT N. Y. EXHIBIT

A Science and Industry Exhibit, presented at the Hotel Biltmore in New York City on February 3 to 6, marked the entry of the Curtiss-Wright Corp. of Wood-Ridge, N. J., into the fields of ultrasonics, industrial television, nuclear equipment, electronic devices for laboratory use, and special plastics with foamed and high temperature characteristics. Also included in the exhibit were such other equipment items as precision spring clutches, heavy duty pumps, and diesel engine governors.

Among the interesting products shown at the exhibit was "Curifoam," the new polyurethane foam produced by Curtiss-Wright. Curifoam is produced in a range of densities from elastic to rigid. It is turned out in flexible sheet stock, natural or colored, approximately one yard wide and in thicknesses from 1/16-inch to 6 inches, and in a range of densities from 2 to 5 pounds per cubic foot.

The product will also be available as a two-component kit, requiring only mixing of two liquids for various foamed-in-place rigid applications. Curifoam resists abrasion, can be sewn, fabricated with common wood-working tools, washed and dry cleaned. It resists oxidation, mildew and vermin, the company states. Curifoam is being produced under both DuPont and Mobay licenses.

Another of the units shown at the exhibit was the company's new ultrasonic tire tester. Unlike other tire testing equipment, this tester selects only the larger disqualifying pockets in rubber when reporting a fault. It ignores non-defective bubbles in the rubber mass.

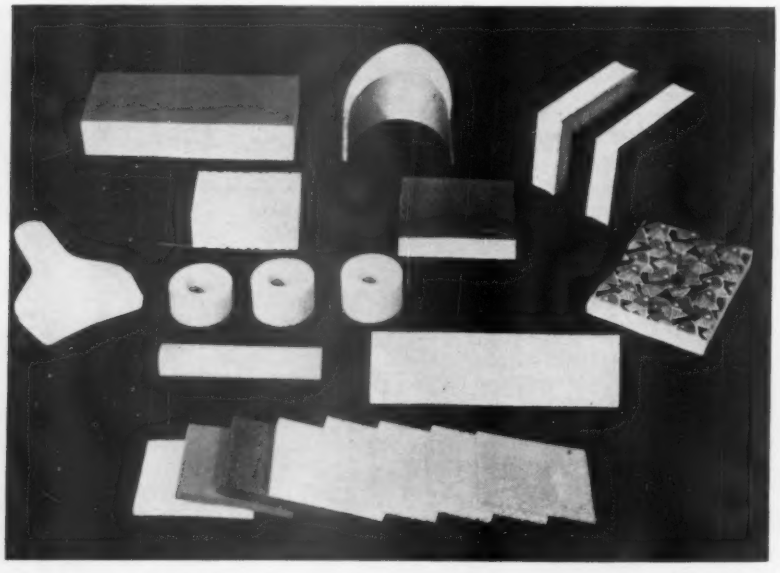
A transmitting transducer located inside the tire radiates a signal through the sidewalls and treaded areas. A series of pick-up detecting transducers search for tire defects represented by attenuation of the sound signal passing to the outside. (EDITOR'S NOTE: A complete description of the Curtiss-Wright Ultrasonic Tire Tester appeared in the February, 1955, issue of RUBBER AGE.)

Another of the units shown at the exhibit was a dielectric heater. This heater uses radio-frequency energy to heat non-metallic materials. The heat is produced by molecular friction in the entire mass of material. Designed primarily for research, development and small plant use, the compact well-shielded unit generates heat within seconds.

Also seen at the exhibit was a new Beta Gauge, a non-contact nuclear testing mechanism useful for providing instant thickness and bonding measurements in the rubber, paper, textile and other industries.

Koppers Styrene Available

Synthetic rubber grade styrene, previously available only to government synthetic rubber plants, is being made available immediately to industrial users by Koppers Co. Inc., Pittsburgh, Penna. Industries previously have been using a commercial grade of styrene priced at 21c a pound. Koppers' move will make available to industrial users the synthetic grade styrene at 18c a pound in tank cars f.o.b. Kobuta, Penna. Koppers said it believes availability of the synthetic rubber grade "will enable certain American industries to improve the economics of their operations which have recently been hurt by foreign competition." On the 18c a pound price, freight will be equalized with the nearest competitive source, Koppers said. The synthetic grade styrene will have a minimum styrene content of 99% and not more than 0.020 sulfur content. Styrene of that purity, according to Koppers, is believed to be entirely satisfactory in all applications except in the production of polystyrene. Commercial grade styrene has a minimum styrene content of 99.5% and no sulfur.



Curtiss-Wright cellular plastics are produced in a wide range of densities. The photograph above shows samples of densities; laminates with wood and metals; pieces decorated by silk screening and flocking, and shapes which may be die cut.

DuPont RCD Changes Name

To better reflect the wider scope of its present activities, the Rubber Chemicals Division of E. I. du Pont de Nemours & Co., Inc., has been renamed the "Elastomers Division". The company states that the 32-year old division was given this more descriptive name because elastomeric materials—neoprene, and more recent developments like "Hypalon" chemical rubber—now represent the largest portion of the group's total volume of business. At the same time, however, the division will continue to expand its technical and sales effort on chemicals.

As originally formed in 1923, the division's main purpose was development and sale of chemical ingredients for compounding natural rubber. In 1931, DuPont introduced neoprene, the first general purpose synthetic rubber. Several years later, research was undertaken in the field of isocyanate reactions, and the division's major products today include "Hylene" organic isocyanates. Neoprene still ranks foremost in sales volume, the company states, but the other elastomers are expected to find increasingly widespread use. The Elastomers Division is a part of DuPont's Organic Chemicals Department. No changes were made in the division's personnel, laboratories, or district offices.

Albert in Bellanca Deal

Sydney L. Albert, well-known industrialist of Akron, Ohio, and a general partner in L. Albert & Son, dealers in new and used rubber and plastics machinery and equipment, has gained stock control of the Bellanca Aircraft Corporation. According to published reports, Mr. Albert secured control of the aircraft concern by trading the business and inventory of his general partnership in L. Albert & Son. Under the terms of the transaction, the L. Albert partnership will continue to exist, and its major business will be conducted in the future under a division of Bellanca. L. Albert & Son was founded in 1891 in Trenton, N. J., by Louis Albert. It maintains plants and offices in Trenton, Chicago and Los Angeles, as well as in Akron and Brantford, Ont., Canada. The Bellanca name will probably be changed to Albert & Son in the future. Mr. Sydney Albert has already become a director and the president of Bellanca Aircraft.

Super-Strength Rayon Cord

American Enka Corp., New York, N.Y., has announced that it is now producing a super-strength type of rayon yarn for tires. The yarn is being sold in commercial quantities and is being marketed under the trade name "Suprenka."

"How to Cut Die and Mold Finishing Time 50% to 94%" is the title of a new bulletin just published by the American Wheelabrator & Equipment Corp., 1290 S. Byrkit St., Mishawaka, Ind. Write for Bulletin 113.

Another copy of RUBBER AGE needed in your office? Use the coupon on page 961.

COMMITTEE D-11 TO UNDERTAKE SYNTHETIC RUBBER STANDARDS

Committee D-11 on Rubber and Rubber-like Materials of the American Society for Testing Materials met in Cincinnati, Ohio, on February 2 to 4 in conjunction with the Annual Committee Week of the parent organization which was held from January 31 to February 4. An outstanding development at the meeting was the decision by Committee D-11 to establish immediately a new subcommittee on Synthetic Elastomers.

This action follows a report received from the operators of the synthetic rubber plants recommending that six test methods for solid polymers, now published in the book of "Specifications for Government Synthetic Rubbers" under the Office of Synthetic Rubber, Reconstruction Finance Corporation, be established as ASTM standards. These methods are:

(1) Determination of Moisture by the Hot Mill Method; (2) Determination of Ash; (3) Determination of Carbon Black in Masterbatch; (4) Determination of Bound Styrene in Butadiene Styrene Rubbers; (5) Determination of Properties of Vulcanizates, including (a) Compounding Recipes; (b) Mixing Procedures; (c) Equipment, and (d) Curing and Testing, and (6) Determination of Mooney Viscosity.

Other Actions Taken

A number of other actions important to the rubber industry were taken at the meeting, which was attended by approximately 150 members and guests. It was recommended that the National Bureau of Standards continue the practice of supplying standard chemicals for compounding materials.

Committee D-11 states that operators of synthetic rubber plants had strongly recommended to the Office of Synthetic Rubber that a large amount of standard sample low temperature, low polymerization rubber be scheduled for production during February or March. Each operator would then arrange transfer of a minimum of 30 bales to their respective inventories. A certain amount could also be transferred to the National Bureau of Standards as the 1955 standard sample.

It was recommended that the assigned value, standard deviation, and range be determined by data from producing plant laboratories. It was also recommended that the National Bureau of Standards set up a standard rubber sample for 1956 and each year thereafter by purchasing such lots of standards, preferably from an industry average. It was also recommended that standard carbon black determinates be included.

Two very interesting papers were given at the main technical meeting of the committee: "Stress Relaxation of Vulcanized Rubber in Compression and Tension" by S. A. Eller, Rubber Technologist, Rubber Development Section, Material Laboratory, New York Naval Shipyard, Brooklyn, N. Y., and "Stress Relaxation of Non-Metallic Gasket Materials" by David R. Lem and John M. Reynar, Materials Engineers, Detroit Arsenal, Center Line, Mich. Discussion revealed much interest in the stress-relaxation characteristics of rubber which are important in many applications.

There was considerable interest in the subject of vinyl foam and similar materials. Consideration is being given to this subject by ASTM Committee D-20 on Plastics, and also by the Society of the Plastics Industry. An effort will be made to arrange a joint meeting of those interested in order to determine how best to proceed with the development of the test methods for these important materials.

TWO NEW VICE-PRESIDENTS ANNOUNCED BY COLUMBIA-SOUTHERN

Joseph A. Neubauer

Robert L. Hutchison

Columbia-Southern Chemical Corp., Pittsburgh, Penna., has announced the election of Joseph A. Neubauer and Robert L. Hutchison as vice-presidents of the company. Mr. Neubauer, formerly technical director for the firm, has been elected vice-president in charge of research and development. Mr. Hutchison has been elected vice-president in charge of operations. Both Mr. Neubauer and Mr. Hutchison are directors of the company. Mr. Neubauer joined Columbia-Southern as a chemical engineer at the Barberton, Ohio, plant in 1933. He was appointed construction engineer at the Natrium, West Va., plant in 1941 and served as plant superintendent when that facility went into production in 1943. During 1946, he was named technical advisor for Columbia-Southern and in 1949 was appointed technical director for the firm. He was elected to the firm's board of directors last year. Mr. Neubauer is a graduate of the Case Institute of Technology with a B. S. in chemical engineering.

Mr. Hutchison joined the firm in 1925 as a draftsman at the Barberton, Ohio, plant. He held various positions in the Experimental Engineering Department, and later had charge of maintenance and construction and finally supervised all engineering at Barberton. He was superintendent of the large chemical producing plant at Barberton from 1940 until 1947 when he was appointed general superintendent for the firm. He was named general manager of Columbia Southern operations earlier this year. A native of Aberdeen, Scotland, Mr. Hutchison is a graduate of Gordon's Technical College at Aberdeen.

Sheller Gets DuPont License

Sheller Manufacturing Corp., whose Dryden Rubber Division was said to be the first United States licensee under the Mobay Chemical Co. patents for the manufacture of polyurethane foams, has also taken out a license on the process developed by E. I. du Pont de Nemours & Co., Inc. The Keokuk, Iowa plant of the Dryden Rubber Division is now being equipped to produce polyurethane foams.

Two Promotions at Goodyear

Goodyear Tire & Rubber Co., Akron, Ohio, has announced the promotion of L. A. Bedford to manager of quality control in the Chemical Operations Department. F. C. Betzhold has been named to succeed Mr. Bedford as section head in the Chemical Materials Development Department. Mr. Bedford, who joined the company in 1944, received his bachelor of science degree in chemical engineering from Ohio State University and his master's degree from the University of Illinois. He is a member of the American Institute of Chemical Engineers and the American Chemical Society. Mr. Betzhold has been with Goodyear since 1943 and received his bachelor of science degree in chemical engineering from the University of Michigan. He is a member of the American Institute of Chemical Engineers.

Take a long time for this copy of RUBBER AGE to reach your desk? Use the coupon on page 961.

AIEE RUBBER SUBCOMMITTEE PLANS TWO-DAY CONFERENCE

The Subcommittee on Rubber and Plastics Industries of the Committee on General Industry Applications, American Institute of Electrical Engineers, will hold a two-day conference on "Electrical Engineering Problems in the Rubber and Plastics Industries" on April 4 and 5 at the Mayflower Hotel in Akron, Ohio. The theme of the conference will be "Automation in Rubber and Plastics Industries." The keynote address on the morning of April 4 on the subject "What Does Automation Mean to a Processing Industry" will be delivered by Everett S. Lee (G-E), past-president of AIEE. A banquet will be held on the evening of April 4. The following papers will be presented on April 4:

"The Status of Automation in the Rubber and Plastics Industries" by G. V. Kullgren, Hale & Kullgren, Inc., Akron, Ohio.

"Electric Drives for Rayon and Nylon Tire Fabric Machines" by C. E. Robinson, Reliance Electric & Engineering Co., Cleveland, Ohio.

"Comparison of Continuous Thickness Measuring Systems" by R. F. Snyder, Goodyear Tire & Rubber Co., Akron, Ohio.

Technical activities on April 4 will also include a symposium on "Automatic Weighing Systems." A. G. Payne (Monsanto) will serve as chairman with the panel composed of the following: R. V. Fisch (Ohio Rubber); R. E. Bell (Toledo Scale); J. C. Williams, Jr. (Weighing Components), and W. M. Young (Richardson Scale).

The program on April 5 includes the presentation of the following papers:

"Comparison of Electronic, Rotating Regulators and Magnetic Amplifiers" by J. P. Montgomery, Westinghouse Electric Co., East Pittsburgh, Penna.

"Report of Special Committee on Electrical Equipment in Contaminated Atmospheres" by Edwin L. Smith, Firestone Tire & Rubber Co., Akron, Ohio.

"Application and Design Considerations of A.C. Motors in Rubber and Plastics Industries" by C. E. Miller, General Electric Co., Schenectady, N. Y.

"Automatic Control Centers for Industrial Processing" by Paul Dickey, Bailey Meter Co., Cleveland, Ohio.

Activities on April 5 will also include a plant trip to the Timken Roller Bearing Co., Canton, Ohio. W. S. Watkins (Ohio Rubber) is chairman of the Subcommittee on Rubber and Plastics Industries. R. D. Heyburn is chairman of the Local Arrangements Committee for the conference.

Surveys Wabash River Valley

The Chicago & Eastern Illinois Railroad has completed a survey of the Lower Wabash River Valley in southwestern Indiana and southeastern Illinois and concludes that the area is excellent for the "successful establishment" of rubber products industries. The 460-page report is said to be the most detailed of its kind ever undertaken in the area. Further information on the report may be secured from the railroad, which maintains headquarters in Chicago, Ill.

Coming Events in the Rubber Industry

Mar. 18. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

Mar. 25. Boston Rubber Group, Spring Meeting, Somerset Hotel, Boston, Mass.

Mar. 31. Rhode Island Rubber Club, Spring Meeting, Pawtucket Country Club, Pawtucket, R. I.

Mar. 31. Southern Ohio Rubber Group, Spring Meeting, Engineer's Club, Dayton, Ohio.

Apr. 1. Akron Rubber Group, Spring Meeting, Mayflower Hotel, Akron, Ohio.

Apr. 1. New York Rubber Group, Spring Meeting, Henry Hudson Hotel, New York, N. Y.

Apr. 6. Los Angeles Rubber Group, Statler Hotel, Los Angeles, Calif.

Apr. 13-15. Society of the Plastics Industry, Pacific Coast Section Conference, Palm Springs, Calif.

Apr. 14. Fort Wayne Rubber and Plastics Group, Van Orman Hotel, Fort Wayne, Ind.

Apr. 14-15. Chemical Institute of Canada, 6th Canadian High Polymer Forum, St. Catherines, Ont., Canada.

Apr. 29. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

Apr. 29. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

May 3. Los Angeles Rubber Group, Statler Hotel, Los Angeles, Calif.

May 4-6. Division of Rubber Chemistry, A.C.S., Spring Meeting, Sheraton-Cadillac Hotel, Detroit, Mich.

May 7-15. Society of the Plastics Industry, Annual Meeting and Conference, Cruise on "Queen of Bermuda."

May 20. Buffalo and Ontario Rubber Groups, International Meeting, Sheraton Brock Hotel, Niagara Falls, Ontario, Can.

May 20. Chemical Institute of Canada, Rubber Division, Sheraton Brock Hotel, Niagara Falls, Ontario, Can.

May 20. Connecticut Rubber Group, Spring Meeting.

May 30-June 1. Chemical Institute of Canada, 38th Annual Conference, Quebec City, Can.

June 2. Rhode Island Rubber Club, Summer Outing, Pawtucket Country Club, Pawtucket, R. I.

June 4. Southern Ohio Rubber Group, Summer Outing, Inland Activities Center, Dayton, Ohio.

June 4-5. Los Angeles Rubber Group, Summer Outing, Coronado Island, Calif.

June 9. New York Rubber Group, Summer Outing, Doerr's Grove, Millburn, N. J.

June 10. Fort Wayne Rubber and Plastics Group, Summer Outing.

June 17. Akron Rubber Group, Summer Outing, Firestone Country Club.

June 17. Boston Rubber Group, Summer Outing, Andover Country Club, Andover, Mass.

June 19-23. American Society of Mechanical Engineers, Diamond Jubilee Semi-Annual Meeting, Hotel Statler, Boston, Mass.

June 24. Detroit Rubber and Plastics Group, Annual Golf Outing, Western Golf and Country Club, Detroit, Mich.

June 26-July 1. American Society for Testing Materials, Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

Aug. 19. Philadelphia Rubber Group, Summer Outing, Manufacturers' Country Club, Oreland, Penna.

Sept. 17. Connecticut Rubber Group, Summer Outing.

Sept. 22. Southern Ohio Rubber Group, Fall Meeting, Engineer's Club, Dayton, Ohio.

Sept. 29. Fort Wayne Rubber & Plastics Group, Hotel Van Orman, Fort Wayne, Ind.

Oct. 4. Los Angeles Rubber Group, Statler Hotel, Los Angeles, Calif.

Oct. 7. Detroit Rubber and Plastics Group, Fall Meeting, Detroit-Leland Hotel, Detroit, Mich.

Oct. 7. New York Rubber Group, Fall Meeting, Henry Hudson Hotel, New York, N. Y.

Oct. 14. Boston Rubber Group, Fall Meeting, Somerset Hotel, Boston, Mass.

Oct. 28. Akron Rubber Group, Mayflower Hotel, Akron, Ohio.

Nov. 1. Los Angeles Rubber Group, Statler Hotel, Los Angeles, Calif.

Nov. 2-4. Division of Rubber Chemistry, A.C.S., Fall Meeting, Bellevue-Stratford Hotel, Philadelphia, Penna.

Nov. 3. Rhode Island Rubber Club, Fall Meeting, Pawtucket Country Club, Pawtucket, R. I.

Nov. 13-18. American Society of Mechanical Engineers, Diamond Jubilee Annual Meeting, Hotel Congress, Chicago, Ill.

Dec. 9. Detroit Rubber and Plastics Group, Annual Christmas Party, Sheraton-Cadillac Hotel, Detroit, Mich.

Dec. 9. New York Rubber Group, Xmas Party, Henry Hudson Hotel, New York, N. Y.

the black

for OUTSTANDING CRACK RESISTANCE

with *good balance* between

HIGH ABRASION and
LOW HEAT BUILD-UP

COLUMBIAN CARBON COMPANY

● A COLUMBIAN COLLOID ●

500 TONS OF SMOKE A DAY

COLUMBIAN CARBON CO. · BINNEY & SMITH INC.

MANUFACTURER DISTRIBUTOR

ISAF (Intermediate Super Abrasion Furnace)

STATEX®-125

HAF (High Abrasion Furnace)

STATEX-R

MPC (Medium Processing Channel)

STANDARD MICRONEX®

EPC (Easy Processing Channel)

MICRONEX W-6

FF (Fine Furnace)

STATEX-B

FEF (Fast Extruding Furnace)

STATEX-M

HMF (High Modulus Furnace)

STATEX-93

SRF (Semi-Reinforcing Furnace)

FURNEX®

COLUMBIAN CARBON CO. · **BINNEY & SMITH INC.**

MANUFACTURER DISTRIBUTOR

INTERESTING PAPERS ON RUBBER HEARD AT SAE DETROIT MEETING

Several papers of interest to the rubber industry were heard at the Passenger Car, Body and Materials Meeting of the Society of Automotive Engineers held on March 1 to 3 at the Sheraton-Cadillac Hotel in Detroit, Mich. SAE is celebrating its Golden Anniversary this year. One of the papers presented at the meeting was entitled, "Natural and Synthetic Rubber in the Automotive Industry" by J. J. Allen of the Industrial Products Division, Firestone Tire & Rubber Co., Akron, Ohio.

In this paper, the author briefly reviewed the history of the development of modern synthetic rubbers. He also showed how the growth in the types of rubber and their application in the engineering of the modern automobile have required the development of adequate specifications in order to insure that the best material for a given application is obtainable.

There is much more to be done, the author stated. Demands are being made for rubber products to function under even more severe conditions, particularly for higher and lower temperatures and with new lubricating and transmission oils.

Another of the papers presented at the meeting was entitled, "Rubber Has Dynamic Properties Too" by Ralph P. Schmuckal of the Ford Motor Co., Detroit, Mich. Mr. Schmuckal's paper dealt primarily with the engine mount as representative of the dynamically functioning rubber components of the vehicle. It was shown how extremely important the measurement and control of dynamic properties are to engine mount performance. Such study and control, however, should not be limited to engine mounts, the author stated.

The ideas presented in this paper apply, with modifications, to nearly all dynamically functioning rubber components. The author stressed that if the part functions dynamically in the vehicle, it should be remembered that rubber has dynamic properties too.

Paper on Fluid Seals

"Fluid Seals" by Ralph Barbour and Robert O. Isenbarger of the Chicago Rawhide Manufacturing Co., Chicago, Ill., was another of the papers presented at the meeting. The authors noted that there is no one ideal material for fluid seals. The various materials have certain outstanding characteristics which make them favorable for certain uses, while other physical properties of that particular material would make their use somewhat less desirable.

Developments in the past years have opened the field for the design of equipment and operations impossible before present-day materials were available, the authors stated. Research people are continuing their studies for newer materials and it can be expected that someday the ideal material for seals will be approached.

W. J. Simpson of the Rubber and Plastics Laboratory, Central Engineering Division, Chrysler Corp., Detroit, Mich., for his part in the meeting, presented a paper on "New and Improved Synthetic Elastomeric Materials for Automotive Use." The author stated that a few years ago most rubber technologists were building rubber compounds for automotive or any other use upon two basic materials—natural rubber and reclaimed rubber.

Somewhat over twenty years ago, compounds made from the oil-resistant specialty rubbers, Thiokol and neoprene, began to appear, and the art of applying these new materials started to develop. Since that time, the increase in available synthetic elastomers which technologists can use to make compounds for a variety of applications has been tremendous.

Mr. Simpson said that the synthetic rubber materials now available include a great variety of types, each of which has its own specialized scope of application. He pointed out a few of the more recently-developed elastomers and also described some of the improvements and new applications of the older types of synthetic polymers.

GANCHAN AND GLEZEN APPOINTED VICE-PRESIDENTS BY AUTOMOTIVE RUBBER

R. P. Ganchan

R. H. Glezen

Automotive Rubber Co., Detroit, Mich., has announced the appointment of two new vice-presidents, both of whom will make their headquarters in the Detroit offices. R. P. Ganchan, formerly associated with the company's plant at Houston, Texas, has been promoted to vice-president and general manager to actively direct the operations of plants in Detroit and Kalamazoo, Mich., Houston, and Savannah, Ga. R. H. Glezen has been appointed vice-president and general sales manager for the company. Mr. Glezen formerly concerned himself, as executive assistant, in the development of new plants and in the exploitation of new markets. He also directed advertising and sales promotion for the firm. Automotive Rubber's expansion in the rubber tank lining and rubber insulated mechanical parts industry has brought along many new developments, including such products as closed-cell sponge rubber and molded closed-cell polystyrene, the company states.

New National Electric Officers

W. C. Robinson, founder and president of the National Electric Products Corp., Pittsburgh, Penna., has been elected honorary chairman of the company. A. L. Robinson has been elected chairman of the board, and W. C. Robinson, Jr., president. A. L. Robinson, Jr., has been elected secretary and a director of the company. James M. Houston has been elected a director of the company.

Need a personal copy of RUBBER AGE? Use the coupon on page 961.

Detroit Holds Winter Meeting

Approximately 175 members and guests of the Detroit Rubber and Plastics Group attended the Annual Winter Meeting held on February 4 at the Detroit-Leland Hotel, Detroit, Mich. The technical portion of the meeting was addressed by Dr. Silas Braley, manager of the technical service laboratory, Dow Corning Corp., Midland, Mich. Dr. Braley's discussion covered the effect of various types of fillers and reinforcing agents on the properties of silicone compositions. He also presented data on the effect of certain curing systems. A dinner followed Dr. Braley's talk. Following dinner, Dr. C. W. Walton, general manager of the Adhesives and Coatings Division of the Minnesota Mining and Manufacturing Co., spoke on "Mining Tomorrow's Gold." Dr. Walton described the problems facing management in the selection of development projects of the greatest possible long range benefit to a company. He pointed out the need for close cooperation among the sales, technical and production departments to assure effective introduction of a new product.

Appointed Exclusive Agents

Minerals Processing Co. of La Grange, Ga., has announced the appointment of the Roger G. Brown Co. of Macon, Ga., as exclusive agents. Minerals Processing is a large producer of beryl and mica. The company has been making deliveries of beryl and sheet mica to the government for stockpiling, as well as quartz granules, punch, scrap and ground mica to the rubber, plastics and other industries.

CONNECTICUT HEARS WADE TALK ON FIBROUS RUBBER

The Winter Meeting of the Connecticut Rubber Group, held on February 18 at the Actors Colony in Derby, Conn., attracted about 150 members and guests. The dinner meeting was preceded by a social hour. Principal speaker of the evening was Dr. Worth Wade of the Patent Development Department, American Viscose Corp., Philadelphia, Penna. Dr. Wade delivered a paper on "Fibrous Rubber, Its Properties and Potential Uses," which he authored in association with Ralph M. Winters, Jr., also of the Patent Development Department of American Viscose, and Laurence R. B. Hervey and Derek E. Till of the Research and Development Division, Arthur D. Little, Inc., Cambridge, Mass.

In his talk, Dr. Wade stated that the new physical form of rubber called "fibrous rubber" consists of a web formed of a multiplicity of small rubber fibers in random distribution and bonded together at their points of contact. The web is formed by a modified spray process called "fibrillation" in which a natural or synthetic rubber is compounded, dissolved in a volatile solvent and the solution projected into a high velocity air stream to form fibers which are collected on a moving screen and cured.

Data were given for the average diameters, tensile strength, modulus and elongation of the individual fibers and for the density, permeability, compression resistance, tear resistance, tensile strength and elongation at the break of the web. Fibrous rubber, said Dr. Wade, has been produced in three forms: (1) Type A—The fibers of the web are solid and relatively large; (2) Type B—The fibers are hollow and relatively large, and (3) Type C—The fibers are very fine and solid.

Describes Potential Uses

Dr. Wade noted that the potential uses of fibrous rubber are the following: (1) Cushions for rugs and carpets and nonskid backings for scatter rugs (Type B); (2) Cushion insoles for both dress and sport shoes (Type B); (3) Surgical goods such as elastic bandages, elastic backing for adhesive tape and strip bandages, elastic supports for the legs and arms where flexibility is essential (Type A).

Also, (4) Upholstery and bedding, preferably laminated to sponge or foam rubber to provide tear resistance (Type A); (5) Girdles, corsets, brassieres and elastic inserts for wearing apparel (Types A and C); (6) Rainwear where both waterproofness and moisture permeability are desired, such as raincoats and baby pants (Type C).

Also, (7) Insulation for electricity, sound, shock and heat (Types A and B); (8) Semi-permeable membranes for the separation of liquid and gaseous mixtures (Type C), and (9) Belts, suspenders, garters and other narrow elastic articles in which the fibrous rubber is preferably coated with a smooth continuous coating of rubber (Type A).

It was stated that a pilot plant is being constructed by American Viscose at Marcus Hook, Penna., and commercial samples of fibrous rubber will be available by about April 15. All inquiries for samples should be addressed to: Ralph M. Winters, Jr., Assistant Manager, Patent Development Department, American Viscose Corp., Philadelphia, Penna.

Correction

Re: Edwin W. Pauley

Our readers' attention is called to an error which appeared in the January, 1955, issue of RUBBER AGE in a news item headed: "Robbins Tire Sues Pauley." In the item, there appeared an accounting of the legal difficulties of Poncet Davis, president of Robbins Tire, during the past year, when he was found guilty on four counts of Federal income tax evasion. In this context, there appeared a sentence which read: "At this time, Mr. Pauley was on trial on four counts of Federal income tax evasion." The sentence should have read: "At this time, *Mr. Davis* was on trial on four counts of Federal income tax evasion." Mr. Pauley, of course, is not involved in any way in any tax evasion litigation. We deeply regret the error and our sincere apologies are extended to Mr. Pauley.

Fort Wayne Holds Meeting

The February 10th meeting of the Fort Wayne Rubber and Plastics Group held at the Van Orman Hotel in Fort Wayne, Ind., was attended by about 110 members and guests. Three interesting papers were heard, one by William E. Manring (Goodrich Chemical) on "Hard Vinyl"; another by Howard A. Gray (Monsanto Chemical) on "Vinyl Sheet and Plastisols," and the third by F. W. Wurtzel (Bakelite) on "Soft Vinyl Extruded and Molded." The group also heard a report by the Nominating Committee for officers of the 1955-56 season. A complete report on the meeting will appear in a future issue of RUBBER AGE.

Buffalo-Ontario Joint Meeting

Following the meeting of the Rubber Division of the Chemical Institute of Canada on May 20 at the Hotel Sheraton Brock, Niagara Falls, Ont., Canada, the International Meeting of the Buffalo and Ontario Rubber Groups will be held. A gala program is being planned for the joint meeting. Principal speaker at the banquet following the meeting will be M. E. Lerner, editor of RUBBER AGE. Mr. Lerner will speak on "Observations and Reflections on the European Rubber Manufacturing Industry."

Need a personal copy of RUBBER AGE? Use the coupon on page 961.

WASHINGTON HEARS WHITBY ON NEWER POLYMER TYPES

Over 65 members and guests of the Washington Rubber Group attended the January 19th meeting held in the Pepco Auditorium in Washington, D. C. Principal speaker of the meeting was Dr. G. Stafford Whitby, consultant to the Department of Rubber Research at the University of Akron, Akron, Ohio. Dr. Whitby spoke on "Some Newer Types of Polymers and Polymerizations."

Dr. Whitby is a pioneer in polymer science, having studied polymerization of styrene and acrylates over twenty-five years ago when the process was vaguely called "resinification." From his experience, he is convinced that polymer study provides a subject for scientific investigation that is still virtually untouched. There is no need yet for specialization as in the vast fields of physical or organic chemistry, he believes. A beginning has been made, however, in modifying polymers both by chemical treatment and by careful manipulation of polymerization techniques, the speaker stated.

Two noteworthy examples of new polymerization techniques were described briefly by Dr. Whitby. The result of the first was referred to as a "block" polymer. This consists of a molecule composed of separate parts or blocks, each block being built out of a single monomer. Such a structure is obviously different from one derived merely by copolymerizing two or more monomers together, he said. Evaluation of polymers made by the different processes discloses marked physical differences even though the chemical composition may be statistically the same.

Discusses Graft Polymers

The second type of polymerization referred to by Dr. Whitby produces a "graft" polymer. One can visualize this system as a chain or "trunk" built of one kind of monomer to which are attached side chains or branches derived from another, Dr. Whitby explained.

Graft polymers have shown some unusual properties among which are reinforcement effects that are built in and seem to be equivalent or better than those obtained from reinforcing materials like carbon black, the speaker observed.

Both of the techniques described open up the possibility of introducing small concentrations of highly reactive groups into polymers. The new polymers may differ only slightly from many already in commercial use. The new "handles," however, will permit greatly simplified means of realizing better properties or extending the range of usefulness of many polymeric systems, Dr. Whitby concluded.

Opens Midwestern Office

Argus Chemical Corp., Brooklyn, N. Y., has announced the opening of an office at 2063 East 4th St., Cleveland, Ohio, to serve the midwest area. The office will be under the direction of Richard N. Derr. Mr. Derr, a chemist, was formerly associated with the Firestone Plastics Co.

QMC ADVISORY COMMITTEE ON RUBBER HEELS AND SOLES MEETS

A meeting of the Quartermaster Corps Industry Advisory Committee on Rubber Heels and Soles was held recently at the Quartermaster Research and Development Center at Natick, Mass., to discuss a program designed to increase the utility, durability and comfort of footwear used by the Armed Forces.

The program calls for quick solutions to three important problems: (1) the standardization of sizes and shapes of rubber heels; (2) the elimination of the marking effects of present rubber heels and soles, and (3) the adoption of a satisfactory method of securely attaching rubber cleated soles to leather boots.

From a military standpoint, the lack of standardized sizes and shapes of rubber heels results in occasional instances wherein footwear fails to provide the full measure of tread surface and uniform good appearance. The problem of rubber footwear causing unsightly marking on floors and other surfaces has resulted in studies of ways and means to eliminate the unsightly marring caused by the carbon black content.

In certain specialized military footwear, rubber cleated soles are provided for superior traction in mountain and jungle areas. The rubber cleats are located away from the edge of the traction surface in order to facilitate the stitching of the sole. This placement of cleats permits a degree of side-to-side "rolling" which in certain precarious positions could cause instability or injury. The objective in this case is to develop a method of extending rubber cleats to the edge of the sole and securely stitch and bond them to the footwear.

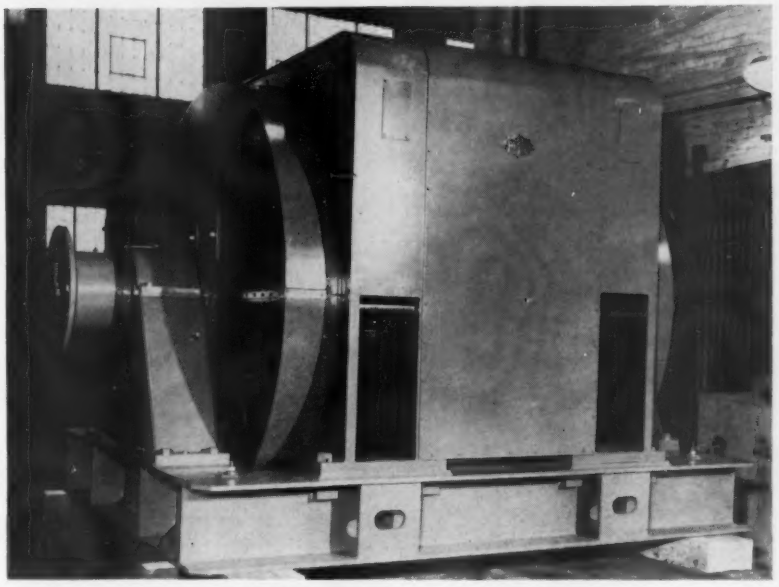
These periodic meetings of the Industry Advisory Committee on Rubber Heels and Soles present opportunities for industry and the military to pool the results of their efforts in the field of footwear to insure maximum time and dollar economies.

Reports on Polyurethane Output

In a talk before the New York Society of Security Analysts on February 28, A. L. Freedlander, president of the Dayton Rubber Co., Dayton, Ohio, revealed that his company will be able to produce at least 10,000,000 pounds of polyurethane foam by the end of 1955, five times its present output. Mr. Freedlander reported that his company's subsidiary, the American Latex Products Corp. of Hawthorne, Calif., already is geared to produce 2,000,000 pounds of polyurethane products in different forms. Additional facilities about to be installed in a parent company plant or plants will add at least another 8,000,000 pounds of capacity, with room for still greater expansion. Dayton Rubber is licensed under patents held by Monsanto, DuPont and Lockheed. It has been engaged in polyurethane research and development for the past several years.

Writing RUBBER AGE? After March 18, 1955, our new address will be 101 W. 31st St., New York 1, N. Y. New telephone number: PEnnsylvania 6-6872.

DEVELOPS TWO-SPEED SYNCHRONOUS MOTOR TO DRIVE BANBURY MIXER



Shown above is a two-speed synchronous motor built by the Electric Machinery Manufacturing Co., Minneapolis, Minn., to drive a Banbury mixer. The motor is to be installed at the Akron, Ohio, plant of the General Tire & Rubber Co. The motor is rated at 450 hp at 180 rpm and 600 hp at 240 rpm. The motor consists of two stators and two rotors, with the rotors mounted on a single shaft. The entire unit is protected by a single enclosure. Ventilating air is brought in through a duct coming into the top of the motor and discharged through the backs of the stator cores. Bearings are oil-ring lubricated and have one-to-one ratio of diameter to length to insure full seating, Electric Machinery states.

Malayan Replanting Program

According to a report from Kuala Lumpur, Malaya's 375,000 rubber small holders are going right ahead with the replanting of 1,500,000 acres of old rubber trees in line with a warning that the industry "must replant or die." There had been some fears that small holders would delay replanting in view of the present high price of rubber and concentrate upon putting all available supplies into the market. However, A. C. Smith, executive officer of the Rubber Replanting Board, said applications already had been received for financial grants to replant more than 51,000 acres this year and more requests were being made daily. The 1955 replanting quota is 60,000 acres. There are about 3,500,000 acres of planted rubber in Malaya. Smallholders account for 40% of the total production which hit around 1,000,000 tons in 1954.

New Ethylene Oxide Plant

The full-scale operation of a new chemicals plant at Seadrift, Texas, for the production of ethylene oxide, polyethylene, and butadiene has been announced by the Carbide and Carbon Chemicals Co., New York, N. Y. Regular bulk shipments of specification grade materials are already being made. At Seadrift, ethylene oxide is synthesized from ethylene by the direct oxidation process which Carbide pioneered in 1937. Ethylene oxide is the major raw material for more than 70 other chemicals vital to the chemical processing industry.

Producing Reactive Intermediates

The first large commercial production of a group of reactive intermediates—acrolein dimer and its derivatives alpha-hydroxyadipaldehyde, hexanetriol-1,2,6, and tetrahydropyran-2-methanol—has just been announced by Carbide and Carbon Chemicals Co., New York, N. Y. Although these products have been known as laboratory chemicals in the past, now for the first time commercial availability makes their use on an industrial scale economically feasible. Acrolein dimer, with its aldehyde group and ethylenic linkage, is a valuable starting material for the preparation of synthetic resins and the synthesis of chemicals for rubber compounding, textile finishing, paper treating, and pharmaceutical and plasticizer manufacture. Alpha-hydroxyadipaldehyde is supplied as a stable 25% aqueous solution because of its high reactivity. Its three reactive groups make it an important intermediate for chemical synthesis and resin manufacture. As a dialdehyde it is useful as an insolubilizing agent for proteins and polyhydroxy materials and a cross-linking agent for polyvinyl acetal and polyvinyl acetate. Hexanetriol-1,2,6 is of general interest as an alkyd and polyester resin intermediate and as a softener, moistening agent, and solvent. Through reaction of its hydroxyl groups it should be useful in the preparation of plasticizers, polyurethane resins, foamed isocyanate resins, drying oils, and special low-temperature lubricants. Tetrahydropyran-2-methanol is of interest in the preparation of plasticizers.

Marvel to Receive AIC Award

Dr. Carl S. Marvel, research professor of organic chemistry at the University of Illinois, Urbana, Ill., has been unanimously chosen to receive the 1955 Gold Medal of the American Institute of Chemists. The award is being made in recognition of Dr. Marvel's "noteworthy and outstanding service to chemists through his teaching for many years and because of his noteworthy research in the field of organic chemistry". Presentation of the model to Dr. Marvel will be made at the 32nd Annual Meeting of the Institute, to be held in Chicago, Ill., May 11 to 13. Dr. Marvel, whose researches materially aided the production of synthetic rubber, especially during World War II, received his A.B. degree from Illinois Wesleyan University; A.M. and Ph. D. degrees from the University of Illinois, and the D. Sc. degree from Illinois Wesleyan. He became an instructor in chemistry at the University of Illinois in 1920, and advanced successively to associate, assistant professor, associate professor, professor of organic chemistry, to his present position as research professor of organic chemistry. His main fields of organic research are in the chemistry of vinyl polymers; synthetic rubber; sulfur dioxide-olefin polymers; hydrogen bonding and its relation to solubility; reactions of acetylenic compounds; hexacrylethanes; and organo-metallic compounds. Under his leadership, more than 125 new kinds of synthetic rubber have been compounded at the University of Illinois. Dr. Marvel is a member of the advisory board of *Organic Syntheses;* associate editor of the *Journal of Organic Chemistry,* and a member of the advisory board of the *Journal of Polymer Science.* He is a member of the National Science Foundation Advisory Panel for Chemistry and chairman of the International Union of the Chemistry's Commission on Encyclopedic Compendia.

Hugh Allen Announces Retirement

More than 200 friends and associates attended a dinner at the University Club in Akron, Ohio, on January 27, to honor Hugh Allen, who is retiring after 35 years with the public relations staff of the Goodyear Tire & Rubber Co. Guests included P. W. Litchfield, Goodyear board chairman, who presented Mr. Allen with a service pin emblematic of his long service. Mr. Allen joined Goodyear in 1920 after having been managing editor of the *Akron Beacon Journal* for six years. He is the author of several books, including "The House of Goodyear", "Rubber's Home Town", a history of Akron, and "The Story of the Airship". During his career, Mr. Allen has figured prominently in the field of aeronautics. An authority on the history and development of lighter-than-air aviation, he served as American representative of the Graf Zeppelin's early flights in this country.

Phoning RUBBER AGE? After March 18, 1955, the new phone number will be PEnnsylvania 6-6872. New address: 101 W. 31st St., New York 1, N. Y.

Robbins Promoted by Goodrich

James M. Robbins

James M. Robbins has been named division production manager of tires, inner tubes, and associated products for the B. F. Goodrich Co. Tire & Equipment Division. Mr. Robbins comes to his new post from Canada where he headed manufacturing at B. F. Goodrich Canada, Ltd. He had been located at Kitchener, Ont., since 1949. A graduate of Rensselaer Polytechnic Institute, Mr. Robbins joined Goodrich as a chemist in Akron in 1928. He then served various manufacturing divisions of the company in its plants in Los Angeles, Calif., and Oaks, Penna., and then went to Sweden as a technical consultant on tire and tube construction. He left Sweden when Nazi armies moved into Norway and Denmark in May, 1940. His next assignment was in Bogota, Columbia, South America, as factory manager and director of a Goodrich associate company. He remained in Bogota until he was transferred to Canada in 1949.

Named Pigment Division Manager

New Jersey Zinc Sales Co., New York, N. Y., has announced the appointment of G.F.A. Stutz as manager of the Pigment Division, succeeding F. W. Jones, who has been named assistant to the vice-president. Mr. Stutz, who was recently appointed manager of technical service, will continue to supervise the activities of that unit. He is a veteran of thirty-two years' with the parent company, most of that time in the Research Department. He became manager of research in 1951. Later, he was appointed assistant general manager of the New Jersey Zinc Co. (of Pa.) at Palmerton, Penna. Mr. Jones has been in pigment sales work for the company for 48 years. He was placed in charge of this activity in 1950. In his new position, he will assist R. G. Kenly, vice-president of the New Jersey Zinc Sales Co.

Plastic Wire & Cable Expanding

Construction of a new wing on the plant of the Plastic Wire and Cable Co. at Jewett City, Conn., is nearing completion. The wing will be used largely for handling government contracts, according to a recent announcement by company officials.

Davis Appeal Nears Court

In recent weeks, the legal involvements of Poncet Davis, president of the Robbins Tire & Rubber Co. of Tuscumbia, Ala., moved nearer conclusion. Mr. Davis is presently appealing his conviction on four separate counts of income tax evasion in the U. S. Circuit Court of Appeals in Cincinnati, Ohio. Government attorneys were to file briefs on the appeal on March 8 and the case has been tentatively set for April. Mr. Davis is now free on a bond of $20,000. He has a five-year prison term and fines totaling $40,000 pending on his appeal to the Cincinnati court.

Meanwhile, in Akron, Ohio, attorneys for both sides finished the taking of depositions in a $1,100,000 suit brought by Mr. Davis against Edwin W. Pauley. Mr. Davis' company, Robbins Tire, had brought the suit against Mr. Pauley, three other individuals and two companies in December of 1954. In this suit, Mr. Davis charged the Pacific Rubber Co., Oakland, Calif., in which Mr. Pauley has a major interest, with concealment of more than $1,000,000 in a transfer of assets to the Bay Rubber Co., a holding concern. Robbins Tire, according to Mr. Davis' petition, owns 41% of the stock in Pacific Rubber. The taking of depositions was preliminary to hearing the action in Federal Court at San Francisco, Calif.

Earlier, Bay Rubber, Mr. Pauley, and a third plaintiff, sued Mr. Davis for $54,000. This suit charged that this sum was Mr. Davis' share of a $150,000 firm expansion program to which Mr. Davis allegedly agreed, then backed out. This suit was originally filed in Cleveland Federal Court while Mr. Davis was on trial for income tax evasion.

Carlisle Acquires Stoner Rubber

Stoner Rubber Co., Anaheim, Calif., has been acquired by the Carlisle Corp., Carlisle, Penna. The company was purchased from N. S. Von Rohr, who will remain as president and chief executive officer. Furber Marshall, president of Carlisle, becomes chairman of the board of Stoner Rubber. Mr. Von Rohr, Mr. Marshall and H. T. Cavanaugh, G. L. Ohrstrom, D. C. Patterson and Merrill Stubbs, the last four named all of New York City, will comprise the board of directors. Carlisle has divisions and subsidiaries in Carlisle and Ridgway, Penna., Memphis, Tenn., Mobile, Ala., and Kansas City, Mo. It is contemplated that Stoner will expand both on the West Coast and in the East but its management will remain substantially the same as in the past.

New Plant for Dunlop Rubber

Dunlop Rubber Co., Ltd., London, England, has leased a plant at Gateshead-on-Tyne. The buildings provide approximately 175,000 square feet and are suited for straight-line production methods. Initially, the plant will be used to meet increased demands for industrial rubber goods or allied products. When fully equipped, the plant is expected to employ about 600 persons.

Tension-Free Tubeless Tires

Production of a new tubeless tire which is claimed to be the coolest running tire yet produced has been announced by the Dunlop Tire & Rubber Corp., Buffalo, N. Y. Design of the new line of passenger car tires, known as the Dunlop Gold Cup "Tension-Free" tubeless tire, follows closely the basically new mold shape announced several months ago which runs at least 10 degrees cooler than conventional tires, according to the firm. The new "Tension-Free" tubeless tires are being produced at Dunlop's Buffalo plant. Mold shape for the new tubeless line permits the tire to assume naturally the section similar to that into which all tires are forced under load. With the conventional tire, this means a constant reverse flexing at the shoulder, with resultant development of severe stresses and destructive heat. By anticipating this distortion in designing the mold, engineers allow the tire to assume the same shape under load, but without the reverse flexing which the conventional tire must undergo. The tension-free running thus attained affords cooler operation, longer life and increased safety, the manufacturer asserts.

Additional benefits are said to include avoidance of tensions in the tread area which lead to uneven distribution of load, with consequent accelerated and often uneven tread wear. Other features include the use of "Super Cordura" which, cord for cord, is admittedly one of the strongest tire fabrics available, and an air-tight inner liner which is integral with the tire body. This construction not only seals to puncturing objects, retarding the escape of air, but also cannot creep and thus cause imbalance and road thump. Punctures are readily repaired without removing the tire, and without destroying the balance or producing thumping.

Complete valve assemblies, together with simple installation instructions, accompany all Tension-Free tubeless tires. Prices are consistent with those of a conventional tire and tube.

Unconditionally Guarantees Tires

Armstrong Rubber Co., West Haven, Conn., has announced a new unconditional road hazard lifetime guarantee against stone bruises, blowouts, rim cuts and any and all road hazards without limit as to time or mileage for all Armstrong passenger tires. Of all the leading tire manufacturers, only Armstrong is said to offer such unusual insurance against road hazards as well as against defects in workmanship and material. According to the terms of the guarantee, the company will replace every tire covered by the guarantee with a new tire of like size and type on a pro rata basis. The customer receives credit for the unexpired normal life of the tire as determined by the depth of the original non-skid tread design remaining on the tire. The new guarantee replaces the company's previous ones of eighteen, twenty-four and thirty-six months for certain types of passenger tires. Armstrong officials state that the new policy has been made possible by the high quality of the Armstrong products.

MOVING RUBBER SIDEWALK NOW IN OPERATION AT HOUSTON COLISEUM

A moving rubber sidewalk, capable of handling 15,000 people an hour and featuring what is said to be the widest conveyor belt ever used commercially to transport humans, is now in operation at the Coliseum in Houston, Texas. Design and installation of the moving rubber sidewalk was a joint engineering project of the B. F. Goodrich Co. Industrial Products Division, the Link-Belt Co., and the Otis Elevator Co. The rubber sidewalk began operation as crowds on hand to attend the 23rd Annual Houston Fat Stock Show and Rodeo stood three abreast on the 82-inch wide unit. The sidewalk carried them across a pedestrian bridge that links a huge parking area with the Coliseum's exposition hall and auditorium. First moving sidewalk to be installed on a bridge, the belt spans the Buffalo Bayou at a height of 50 feet, traveling at a speed of 132 feet a minute. In its 114-foot course, the belt rises 12 feet to deliver passengers to the exposition hall. To accommodate passengers leaving the Coliseum area, the direction of the sidewalk is reversed. Sidewalls, three feet high, enclose the unit on both sides and are equipped with moving handrails synchronized with the speed of the belt. Passengers step on and off the belt as if it were an escalator. The belt measures 230 feet in length, is 7/8 of an inch thick with seven plies of fabric for interior reinforcement. A specially-compounded rubber provides a scuff-resistant easy-to-clean surface. The belt travels on closely spaced steel rollers and is powered by an electric motor which turns a drive pulley located at the upper end of the walk, the participating companies explain.

Forms Plastics Department

Gummiwerk Odenwald G.m.b.H., with main offices in Frankfurt/Main, Germany, a leading manufacturer of rubber soling, bicycle tires and tubes, mechanical goods and rubber reclaim, has announced increased production in their newly activated Plastic Department. Although additional products are in the development stage, a battery of ultra modern plastic extruders is turning out polyethylene under the trade name "Ylopan" in plain film as well as in tubular form. German as well as American resins are being used. A special fabricating and printing department is also supplying small bags to largest heat-sealed covers to specification. Jakob Hirschberger, executive director and major shareholder of Gummiwerk Odenwald, is also president of the Rotex Rubber Co., Inc., and Alpha Chemical & Plastics Corp., both of Newark, N. J.

Claremont Pigment Dispersion Corp., Brooklyn, N. Y., has issued a new bulletin on "Calibrated Color Pastes for Vinyl Banbury Compounding."

Polyethylene Glycol 20M

"Carbowax" polyethylene glycol 20M, with an estimated molecular weight of 15,000 to 20,000 has been announced by the Carbide and Carbon Chemicals Co., New York, N. Y. The new product is available in carload quantities and is the tenth member of the company's series of Carbowax polyethylene glycols. The new product gives the series a molecular weight range of 200 to 20,000. Carbowax 20M is a water-soluble, white solid with the binding, suspending, and lubricating properties typical of the polyethylene glycol compounds. It is said to show promise as a release agent for rubber where intricate molds require a viscous lubricant. Both the melt viscosity and aqueous solution viscosity of Carbowax 20M are considerable higher than those of Carbowax polyethylene glycol 6000, the highest molecular weight compound heretofore available. Films formed with 20M are stronger and harder than those formed with other solid polyethylene glycols, the company states. The solution viscosity of 20M is about twice that of equivalent gum arabic solutions.

Investigates Cable Insulations

Underwriters' Laboratories, Inc., has recently completed an investigation of thermoplastic insulated and jacketed cables intended for use in interconnecting protective signaling system components. Construction of the cables and method of installation is in conformity with the June, 1954, edition of the National Board of Fire Underwriters' Standard for Proprietary, Auxiliary, Remote Station, and Local Protective Signaling Systems. The cable is intended for use both below ground and as inside wiring. The investigation by the Laboratories, in addition to standard tests for the class of materials employed, included determinations of low temperature flexibility, resistance to crushing, and resistance to impact. The results of the investigation indicated acceptable performance (1) on the basis of criteria previously established for Type UF and Type NMC cables and (2) in comparison with presently recognized cables for the same use but employing a neoprene jacket. On the basis of the foregoing, the cable was considered to be acceptable and has been listed under the Laboratories' Reexamination Service.

Expands Dispersion Facilities

New manufacturing and shipping facilities are under construction at the Bound Brook, N. J., plant of the R-B-H Dispersions Division of Interchemical Corp. The projected units were made necessary, the company said, by the continued expansion in volume and scope of R-B-H's pigment dispersion business. Two new buildings—a two-floor wing on the main manufacturing building and a one-floor storage and shipping section—are slated for completion by July, 1955. The new manufacturing wing will increase production area in that unit by more than a third, and will provide on the second floor a large increase in storage space for raw materials. Shipping space and warehouse area for finished goods will be doubled. The increased use of pigment dispersions is attributed by R-B-H Division President Harold D. Craft to "a broader use of color in all parts of our lives." He adds that it also reflects a growing concern of many industries to upgrade the quality of their products with fine dispersions of color.

Buys Lorraine Manufacturing

C. & C. Super Corp., New York, N. Y., has acquired the Lorraine Manufacturing Corp. of Maywood, N. J., manufacturers of a line of mechanical goods. Lorraine will be operated as a division of C. & C. Super. The new division will continue to produce mechanicals and, in addition, will produce exclusively for C. & C. Super a new type of cap-top closure. The new closure utilizes a special type of rubber as a lining instead of the conventional cork. James G. Groendyk, formerly president of Lorraine, has been elected a vice-president of C. & C. Super and will be in charge of the company's new Lorraine Division. C. & C. Super is a holding company for enterprises in the restaurant, food and soft drink fields.

Acme-Hamilton Promotes Kahn

Marvin M. Kahn

L. J. Howell, executive vice-president and general manager of the Acme-Hamilton Manufacturing Corp., Trenton, N. J., has announced the promotion of Marvin M. Kahn to the position of director of development for new products. Mr. Kahn has done significant development work on both rubber and plastic hose and has assigned patent rights on a new type of plastic hose to the corporation. He is an alumnus of the Massachusetts Institute of Technology, class of 1938, where he majored in physics.

Witco Chemical Acquires Emulsol

Witco Chemical Co., New York, N. Y., has acquired the Chemical Division of the Emulsol Corp. of Chicago, Ill., and has organized the Emulsol Chemical Corp. to produce the many chemicals which have been produced in these facilities for many years. Continuing as president of Emulsol is Benjamin R. Harris, identified with the company since its inception. Solomon Epstein, connected with the company for many years, will serve as executive vice-president. Changes in personnel or policy are not contemplated. Key personnel of Emulsol Chemical have been prominently identified, during the past 30 years, with many major developments in surface active agents for wetting, emulsifying, dispersing, foaming, sanitizing, bodying, deflocculating, defoaming and cleansing for use in many processing industries such as rubber, paper, textile, etc.

Tire Prices Increased Again

For the second time in as many months, major manufacturers of tires have announced price increases. Generally, all types of passenger car tires were raised 2½%; all commercial and small sizes of truck tires through 7.50 cross-section were also raised 2½%; all large truck and off-the-road tires, 8.25 size and larger, were raised 5%; all industrial solid and pneumatic tires advanced 7½%. The price increases went into effect on or about February 15 and were generally attributed to increased prices for natural rubber. In general, tubes and farm tires were exempt from the general price increases.

Rubber Patent Abstracts

The final book in the 1954 series of seven new government publications containing abstracts or brief descriptions of government-owned inventions was recently announced by the Government Patents Board, Washington, D. C. The new book, entitled "Ceramic, Paper, Rubber, Textile, Wood and Other Products and Processes", lists 308 abstracts describing patented inventions applicable to the several fields included in the title. In addition to the abstracts, the book includes the title and the number of each patent, name of inventor, the government agency administering the patent, and a list of the addresses of the field offices of the U. S. Department of Commerce and of the Small Business Administration which may be consulted for further information concerning the availability and use of any government-owned inventions. The new book may be purchased at $1.00 a copy from the Office of Technical Services, U. S. Department of Commerce (Room 6227), Washington 25, D. C. (Order No. PB 111470).

Remodels Company Laboratories

American Resinous Chemicals Corp., Peabody, Mass., has announced the completion of an extensive program of remodeling affecting all their laboratories at the Peabody plant. The new laboratory area includes major work areas for resin and plastic emulsions, solutions and hot melts; a constant temperature room; special work areas for solvent adhesives and coatings containing pilot plant processing and churning equipment; a sample room; and a conference room. Special testing equipment is available for testing aging, oxidation, and sunlight as required for coatings for fabric or paper. Other special equipment is used for tensile and shear tests on adhesives of both emulsion and solution types. In addition to regular compounds for the textile, paper, plastic, rubber, automotive and floor covering fields, American Resinous develops special adhesives or coatings for specific customer uses.

Austin Named Davidson Agent

Charles D. Austin & Co., Valley Road, New Canaan, Conn., have been appointed sales directors for the Davidson Products Co., also of New Canaan, manufacturers of corrective and maintenance chemicals for the rubber industry. Davidson Products' line consists of de-carbonizing materials for cleaning molds, mold release compounds, slab dips, and a general line of detergents and chemicals for the economical maintenance of all divisions of a manufacturing plant. Charles D. Austin & Co. has certain territories open to manufacturers' representatives and for direct sales representatives having the necessary qualifications.

Phoning RUBBER AGE? After March 18, 1955, the new phone number will be PEnnsylvania 6-6872. New address: 101 W. 31st St., New York 1, N. Y.

Power Trac Off-the-Road Tire

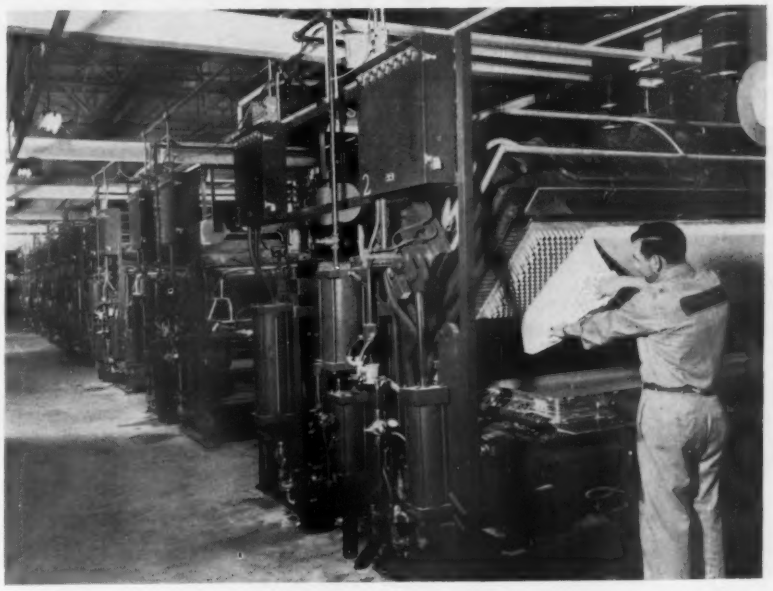
Seiberling Rubber Co., Akron, Ohio, states that recent advances in chemistry have made possible the development of a new off-the-road truck tire with 50% greater resistance to cutting and tearing than ordinary tires of this type. This was revealed when an official of the firm announced that the company had perfected a new cut-resistant tread rubber compound and, after months of field and laboratory testing, was now in production of a new tire using this compound. The tire's toughness, or resistance to penetration and cutting, is achieved by combining "recently available" chemicals with other materials to form the new compound, L. M. Seiberling, sales vice-president, said. "Extensive testing shows that this tread is about 50% tougher than those on similar special purpose tires," he reported. Known as the "Power Trac," the new tire is designed for mining, logging, oil field and construction work or other off-the-road service where sharp rocks cut and tear ordinary treads, Mr. Seiberling pointed out.

The Power Trac is designed specifically for such operations and is not intended for use where long runs at high speed are involved, he added. About 20 pounds more tread compound is used in the new tire than in similar off-the-road tires and the tread pattern has been deepened for better traction. Lugs in the tread are also heavier and are spaced farther apart in the shoulder area for added traction. "Ejector" ridges in the tread prevent stones from becoming wedged between the lugs and forced into the tire body when the Power Trac is in use. The new tire is available in both rayon and nylon construction in sizes 8.25-20 through 11.00-24.

Introduces Antioxidant 425

Full-scale commercial production of the new non-discoloring and non-staining life prolonger for natural and synthetic rubbers, "Antioxidant 425," has been announced by the Intermediate and Rubber Chemicals Department of American Cyanamid Co., Bound Brook, N. J. Its principal use is for compounding of white and light colored rubber goods. Antioxidant 425 was developed to provide producers of white and light colored products with a good antioxidant possessing minimum tendencies to develop color on exposure to light and other aging conditions, the company states. Chemically, Antioxidant 425 is 2,2'-methylene bis (4-ethyl-6-tertiary butyl phenol). It is a white crystalline powder with a melting range of 119° to 125°C. and a specific gravity of 1.10. The producer recommends dosages of 0.5 to 1.5% Antioxidant 425 on the rubber hydrocarbon. These quantities give very good protection against the effects of oven (heat) and oxygen bomb aging. Dosages as low as 0.25% give effective and satisfactory protection in some stocks. Antioxidant 425 in the suggested dosage has little or no effect on the rate of cure so that no accelerator adjustment is required. Rubber compositions containing 2.0% Antioxidant 425 have shown no evidence of antioxidant bloom after extended aging, the company declares.

FIRESTONE INSTALLS THIRTY NEW PRESSES FOR FOAMED RUBBER PRODUCTS



Firestone Industrial Products Co. has completed the installation of thirty presses at its Fall River, Mass., plant. The new units will increase by one-third the capacity for production of "Foamex" pillows and furniture cushions. According to P. P. Crisp, company president, the new production units at Fall River will have a capacity of 275,000 pounds of foamed rubber products a month. The presses and other equipment in this unit represent an investment of more than $900,000. The new automatic units supplement other foamed rubber manufacturing equipment at the Fall River plant, which is said to be one of the nation's largest producers of transportation seating, mattresses, pillows, furniture cushions and molded and slab stock. According to Mr. Crisp, the industry is expected to sell more than 1,000,000 foamed rubber mattresses during 1955. He estimates that total foamed rubber production from both natural and synthetic latex in 1955 will exceed 205,000,000 pounds, approximately 12% more than in 1954. The photograph above shows an operator stripping a seating cushion from one of the molds at the Fall River plant.

Full Tubeless Truck Tire Line

Goodyear Tire & Rubber Co., Akron, Ohio, has launched a full tubeless truck tire program and is said to be the first in the industry to extend this tire feature through its entire line of tires from pickup trucks to the big tractor trailers and giant earthmovers. Goodyear states that it was able to extend the tubeless tire to every work vehicle by two developments unique in the tire industry. First came the exclusive "3-T" triple-tempering cord process. The second development was the creation of an entirely new family of air locking rims on which all sizes of truck tires, from the smallest to the largest, can be easily and quickly mounted. The company states that they have developed a radically new concept of a rim that will work with a tubeless tire and called it the Goodyear "Tru-Seal" rim. It is simply a three-piece rim with a small rubber ring which locks in the air. Goodyear is developing the Tru-Seal for all sizes of tubeless truck tires since the top of the range for the best tubeless tire performance with a single piece drop-center rim is reached at the 10.00-20 size.

Need a personal file of RUBBER AGE? Use the coupon on page 961.

Denflex Plastisol Coatings

Dennis Chemical Co., St. Louis, Mo., has introduced a new series of "Denflex Plastisol Metal Coatings", the success of which is attributed to a one-coat primer which tightly bonds the plastisols to metal surfaces such as steel, copper, brass, aluminum or galvanized iron. The primer, "Denflex No. 2386", may be applied by brushing, dipping, roller coating or spraying. After an air dry of 15 to 20 minutes on most surfaces the specially formulated plastisol finish may be applied and baked. A spray or dip application can be used to produce a soft, resilient, decorative coating or a hard, tough finish of substantial thickness. Gloss and color can be supplied as desired. Outstanding properties are resistance to weathering, abrasion and corrosion, and for electrical insulation. The high chemical resistance of vinyls is maintained. Suggested uses are for tool handles, tank linings, outdoor furniture, air conditioner cabinets, etc.

U. S. Rubber has purchased four acres in Cleveland, Ohio, as a site for a new branch office and warehouse for the company's Tires, Mechanical Goods and Footwear Divisions.

NAMES IN THE NEWS

DR. ALEX SACHER has been appointed technical director of the Standard Insulation Co. of East Rutherford, N. J. He was formerly associated with the Mellon Institute and Irvington Varnish.

C. W. GRADY, formerly associated with the Pennsylvania Tire Co., has been appointed West Coast regional sales manager of the Dunlop Tire & Rubber Corp.

CLARENCE B. SAMPAIR, vice-president in charge of production and industrial relations for the Minnesota Mining & Manufacturing Co. and president of its International Division, has been elected to the board of directors.

KENNETH R. BROWN, vice-president of the Atlas Powder Co., Wilmington, Del., has been awarded the 1955 honor award of the Commercial Chemical Development Association.

H. W. NORTH has been appointed chief engineer of the newly-established Process Equipment Department, Engineering Works Division of the Dravo Corp.

ROBERT R. MELTZ, until recently associated with the Quaker Rubber Corp. at Philadelphia, Penna., has joined the Vulcanized Rubber & Plastics Co. at Morrisville, Penna., as a research chemist on soft rubber.

RICHARD S. LOVELESS, formerly associated with the Neff-Perkins Co., operators of Molded Rubber Specialties, Inc., has joined the Rubber Products Division of the Lovell Manufacturing Co. at Erie, Penna.

ELI A. ISQUITH has joined the Randex Foam Rubber Co. of Brooklyn, N. Y., as chief chemist.

A. J. LAMOND, associated with the Quaker Rubber Corp. of Philadelphia, Penna., for the past twelve years, has been named manager of packing sales.

V. R. JACOBS, manager of government sales of the Goodyear Tire & Rubber Co., has been awarded a service pin by the company commemorating 35 years' continuous service.

J. TERRY TAYLOR, associated with the B. F. Goodrich Co. for the past 15 years, has been named technical manager, fuel cell design and engineering for the Aeronautical Products Department of the Tire & Equipment Division.

HENRY C. ZENI has been named sales manager of the Arizona Chemical Co. Arizona Chemical is jointly owned by American Cyanamid and International Paper.

ARTHUR E. GABRIEL, formerly associated with the Armour Research Foundation, has joined the staff of the Evans Research and Development Corp., New York, N. Y., as research project leader.

CARL F. UNGER, associated with Hewitt-Robins Inc. for the past year, has been named manager of municipal fire hose sales. He was previously associated with the National Gypsum Co.

JOHN WARE has been promoted to vice-president of sales research, treasurer and sales manager of the Kenrich Corp., Maspeth, N. Y. Mr. Ware is also a director of the company.

WILLIAM F. FLOWER, formerly associated with Goodyear and Goodrich, has been named sales manager of the new Foam Rubber Products Division of the Collins & Aikman Corp., New York, N. Y.

JAMES ADAMS, JR., has been appointed chief engineer, research and product design, at the Manhattan Rubber Division of Raybestos-Manhattan, Inc., Passaic, N. J.

LOUIS G. HELMICK, JR., formerly manager of manufacturing of the Joy Manufacturing Co., Pittsburgh, Penna., has been elected vice-president of manufacturing.

R. V. FALCONIERO, associated with the Lee Rubber & Tire Corp. since 1931, has been elected assistant treasurer.

FRANK REINHART, chief of the Plastics Section at the National Bureau of Standards, Washington, D. C., was elected president of the Society of Plastics Engineers at the National Convention held in Atlantic City, N. J., January 26 to 28.

DR. ALYN M. BEDELL has been appointed technical director of the Dismuke Tire & Rubber Co., Inc., Clarksdale, Miss.

To Market Trademarked Plastics

Koppers Co., Inc., Pittsburgh, Penna., has announced that henceforth it will market its entire plastics line under trademarks. Heretofore, the plastics had been designated by number. Koppers polystyrene will be marketed under the trademark "Dylene," while the company's expandable polystyrene will be designated "Dylite." "Dylan" is the new trademark for polyolefin plastics. Koppers styrene-butadiene latices will be trademarked "Dylex." The company feels that the use of these names will allow molders of plastic products to label their goods showing the exact type of material used in their manufacture, and thus tie in with Koppers national advertising and promotion.

Felleman Joins Woloch Co.

Philip N. Felleman

George Woloch Co., Inc., New York, N. Y., rubber and plastics dealers, has announced that Philip N. Felleman has joined the organization in an executive capacity. For over twenty-five years, Mr. Felleman has been well-known in the industry, having been co-owner of the McCormick Rubber Co., vice-president of Meyer & Brown Corp., and sales manager of the Plastics Division of H. Muehlstein & Co.

Welch and Benton Join Goodyear

Two special technologists have been added to the Chemical Products and Materials Development Division of the Goodyear Tire & Rubber Co., at Akron, Ohio. William F. Welch will handle development and customer service work involving the application of "Chemigum" latices to textile fabrics and Richard E. Benton will concentrate on development work on methods and techniques of using Goodyear latices in paper products. Mr. Welch received his degree in textile chemistry from the Lowell Textile Institute located in Lowell, Mass., his birthplace. He is a member of the American Association of Textile Chemists and Colorists and Delta Kappa Phi fraternity. Mr. Benton received his degree in pulp and paper technology from the University of the State of New York in Syracuse, N. Y.

United Carbon Promotes Five

United Carbon Co., Charleston, West Virginia, has announced five promotions in two of its main subsidiaries. A. G. Treadgold, assistant treasurer of the parent company, has been named vice-president of the United Carbon Co., Inc., the carbon black division of the United Carbon Co. Dr. I. Drogin, director of research, has been named vice-president in charge of technical sales, and Grant Thomas, director of public and labor relations, has been named vice-president for sales of United Carbon Co., Inc. Arthur Hanson, controller and assistant secretary of the parent company, has been named administrative vice-president, and H. L. Heater, associated with the legal staff, has been appointed assistant secretary of the United Producing Co., the oil and gas division of the United Carbon Co.

Named Head of Koppers Research

Dr. E. W. Volkmann has been appointed manager of the Research Department of the Koppers Co., Inc., Pittsburgh, Penna. In this position, Dr. Volkmann will be responsible for the coordination of all Koppers research, including work at its Verona, Penna., Research Center, and elsewhere in the country. At the same time, it was announced that Dr. A. R. Powell, who has been acting manager of the Department, has been appointed special research adviser and will be available for advice on all research and development problems. Dr. Volkmann, a native of Germany, was graduated from the Technical Institute of Munich with a degree in mechanical engineering in 1924. He then came to the United States, receiving his master's and doctor's degrees in chemical engineering at Columbia University, and remained here to become an American citizen. He joined a predecessor company of Koppers as a chemical engineer in 1926, leaving in 1931 to complete his postgraduate work. He returned to Koppers in 1934 as assistant technical director of its Tar and Chemical Division. In 1940, Dr. Volkmann became associated with Koppers Research Department. In 1952 he was appointed associate director of the department. Last fall he was assigned to Koppers overseas staff in Europe as a technical specialist for the Tar Products Division.

One of the nation's leading scientists in coal chemical technology, Dr. Powell is a native of Athens, Ohio, and received his bachelor of science degree in chemical engineering from the University of Kansas. He received his master's degree from the University of Nebraska and his doctor's degree from the University of Illinois. After leaving his research and teaching activities at the University of Illinois, Dr. Powell was associated with the United States Bureau of Mines in Pittsburgh, Penna., from 1919 to 1923. During 1923 he also held a Koppers fellowship at the Mellon Institute of Industrial Research. From 1923 until 1928, Dr. Powell held the post of research chemical engineer in charge of large-scale research at Koppers Chicago plant. In 1928 he was placed in charge of Koppers Seaboard experiment station at Kearny, N. J., and four years later was named assistant manager of the Research Department in Pittsburgh. In 1949 he was named associate manager of the department and last year was appointed acting manager.

Riverlake Bill Nears Vote

According to reports from Ohio, there is a possibility that the Riverlake Belt Conveyor bill may soon be reported out of the Ohio House Commerce and Transportation Committee and come up for a vote. Hearings on the bill have been going on for the past few weeks. Before the belt line can become a reality, legislation touching upon rights of "eminent domain" is required. The proposed two-way belt line would run a 105-mile course between Lake Erie and the Ohio River near East Liverpool, transporting iron ore and coal, its sponsors state.

Named Sales Representative

Robert E. Barnum

Robert E. Barnum has joined the Chemical Division of the Goodyear Tire & Rubber Co., as field sales representative in the Southeastern district. Mr. Barnum will headquarter in Atlanta, Ga., and will be engaged primarily in selling "Pliolite" resins and latices to the paint industry. His sales coverage will include Georgia, the Carolinas, Florida, Alabama, Mississippi and part of Tennessee. Prior to taking over his new duties, Mr. Barnum served on Goodyear's production squadron and also completed a training period with the Chemical Division. Mr. Barnum was born in Raleigh, N. C., and was graduated from the University of Florida with a bachelor of science degree in chemical engineering.

Socony-Vacuum to Change Name

Directors of the Socony-Vacuum Oil Co., Inc., have voted to change the company's name to Socony Mobil Oil Co., Inc. The proposal will be submitted to stockholders at their annual meeting on April 28. The company said the objective is to link the corporate name and the brand names of the company's principal products. The firm was incorporated in 1882 as the Standard Oil Co. of New York. In 1931, when it acquired the Vacuum Oil Co., the name was changed to the Socony-Vacuum Corp. The name was changed to the Socony-Vacuum Oil Co., Inc., in 1934, when the company ceased to be primarily a holding company and took over the direct operation of certain of its properties.

Alfred Hale Rubber to Move

Located in North Quincy, Mass., since its inception, the Alfred Hale Rubber Co., Inc., will move its offices and production facilities to Lima, Ohio. The officers of the company state that this move will provide better services to customers through expanded and modernized facilities at the new location. Moving operations are scheduled for completion within the next two months. All customer requirements have been anticipated and the move is not expected to affect service or delivery, the company states.

Manufacturing Plastic Products

Manufacture of plastic products, from trays to complete automobile bodies, has started at the Goodyear Aircraft Corp., Akron, Ohio, following installation of five heavy presses designed to form large reinforced plastic products. The presses, which range in size from 100 to 700 tons, and auxiliary equipment, cover an additional area of 25,000 square feet assigned by the company to the production of canopies and laminates. The over-all facility, most modern, and perhaps largest of its kind built for the production of reinforced plastic items, will accommodate mass production. The heavy press line-up enables Goodyear Aircraft to produce sizable plastic parts, such as automobile bodies, boats, fuel tanks, packaging cases, missile and other complex aircraft components, farm implements and a variety of other products. The equipment, which required a year to install, includes in addition to the 100 and 700-ton presses, three 100-ton units. All are hydraulically operated. Supplemental equipment includes preforming machines, ovens, mixers and grinding booth. First job for the imposing 700-ton press, largest of its kind, is the production of one-piece hulls for outboard boats, to be marketed by Bowman, Inc., internationally-known boat manufacturers of Little Rock, Ark. Goodyear Aircraft has been producing optically-clear canopies, in addition to a variety of reinforced plastic products, since 1945.

May Establish Ceylonese Plants

Two American rubber manufacturing companies, the Firestone Tire & Rubber Co. and the Goodyear Tire & Rubber Co., have begun negotiations with the Ceylonese government with a view to establishing factories in Ceylon. Both companies are willing to invest about $5,000,000 for factory projects in that country. Some months ago, one of the companies opened negotiations with the Ceylonese government for the establishment of a rubber plant, but the talks broke down over disagreement on the question of capital investment. Since that time, Ceylon's policy regarding foreign investments has been altered and the Ceylonese Prime Minister, Sir John Kotelawala, when he was in the U. S. recently, made a special appeal for investment of American capital.

Atlas Powder Moves Offices

On February 11, the Atlas Powder Co. moved its general offices from the Delaware Trust Building in Wilmington, Del., to a new building of its own on a 45-acre tract about three miles from downtown Wilmington. The new general offices are located at Concord Pike and New Murphy Road, Wilmington 99, Del. The new telephone number is Wilmington 8-6511. The new building, under construction for fourteen months, will provide additional space as well as the most up-to-date facilities for the company's office staff. Adjacent to the office building is a cafeteria-recreation building for employees. The grounds include a swimming pool, tennis courts and baseball diamond for employee use.

New Rear Tractor Tire

A new rear tractor tire said to offer 51% more wear and with a double-braced lug design to meet the needs of modern tractor operation has been announced by the U. S. Rubber Co., New York, N. Y. Called the "U. S. Royal Super Grip Master," it is made with extra tough compounds that give it as much abrasion resistance as giant construction tires. The new design is particularly effective in extending tire life where tractors are used on hard-surfaced roads. More than ever before tractor equipment is moved from one farm to another, or from one section to another over hard surfaces. The tire is braced on both the leading and trailing edges of the lugs to stabilize it against scuffing from bar flexing or layback. Uneven tread wear is greatly reduced by this double bracing. Excellent pulling power in the new tire is achieved, company officials state, because the lugs penetrate to full biting depth. The tire also has a very wide self-cleaning tread from shoulder to shoulder. A padded rolling center on the tire reduces vibration, and helps cushion the ride when tractors are used on hard surfaces. The tire will be produced in a complete range of sizes from 8-24 two-ply through 15-34 eight-ply. Including the various play constructions, the tire is available in 53 different sizes.

Goodrich Tubeless Truck Tire

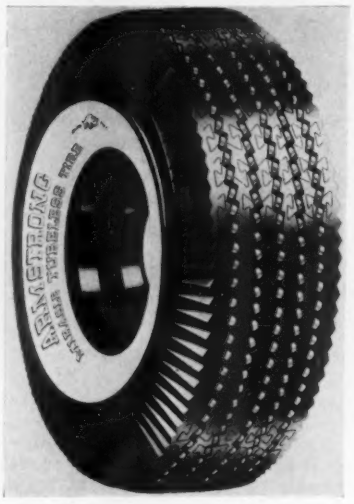
A new tubeless, puncture sealing, blowout protected truck tire is now available in the 6.50-16 6-ply size, according to an announcement by the B. F. Goodrich Co., Akron, Ohio. The heavy duty tubeless truck tire is designed expressly for commercial truck owners. In addition to sealing punctures on the rolling wheel, eliminating tube problems, the new tire incorporates protection against blowouts and employs a "grip block" tread which assures skid protection in any driving conditions, according to the company. The permanent puncture-sealing tubeless truck tire has been engineered for city delivery and public utility trucks of all kinds where uninterrupted service is of primary importance, Goodrich said. The new tire can be repaired and recapped using conventional methods and equipment, and the 6.50-16 size represents about 12% of all truck tires sold for replacement making it the most popular size for light trucks. The new tire can be mounted only on drop center rims.

Usable in Non-Toxic Vinyls

The Plasticizer Division of the Pittsburgh Coke & Chemical Co., Pittsburgh, Penna., announces that one of the plastics industry's most useful and versatile plasticizers, "PX-108 DIOP," has now been approved for use in non-toxic vinyl formulations. The approval of diisooctyl phthalate for non-toxic formulations enables plastic manufacturers to use it in the production of wrapping film for most foods and for the manufacture of intravenous vinyl tubing. The development of this new use for diisooctyl phthalate is a joint accomplishment of Pittsburgh Coke and the Indoil Chemical Co. of Chicago, Ill.

Armstrong Miracle Tubeless Tire

Armstrong Rubber Co., of West Haven, Conn., has announced the newest addition to their line of tires, the "Miracle Tubeless Tire". A Butyl rubber liner inside the case of the Miracle Tubeless Tire takes the place of the conventional tube. The air-resistant liner is bonded to the tire itself and offers positive protection against blowouts, the company reports. In addition, the Armstrong Miracle Tubeless Tire is said to be



the only tubeless tire featuring the Miracle tread with safety discs. Small rubber bumpers molded to the side of each tread keep the gripping edges apart for better side skid control, improved braking traction and a more silent ride. The four center ribs are molded flat with all curvature on the shoulder ribs. According to the manufacturer, this minimizes cupping and other irregular wear. The Armstrong Miracle Tubeless Tire is being made in black and white sidewall, in sizes 6.70-15, 7.10-15, 7.60-15 and 8.00-15.

Mercaptan Synthesis Plant

A new mercaptan synthesis plant, said to be the first unit anywhere in the world capable of producing synthetic methyl mercaptan in multi-million pound quantities, has just been completed at Texas City, Texas, by the Pan American Refining Corp., the refining subsidiary of the American Oil Co., New York, N. Y. The plant, construction of which began in March, 1954, represents an entirely new venture for Pan American in the petrochemical field. At capacity operation, 5,000,000 pounds of methyl mercaptan a year will be produced. While the unit was designed primarily for methyl mercaptan production, its construction will allow flexibility of operation and the production of other mercaptans such as ethyl mercaptan, and propyl mercaptan. Other important products such as dimethyl and diethyl sulfides are available for recovery in quantity as markets are developed.

Take a long time for this copy of RUBBER AGE to reach your desk? Use the coupon on page 961.

Rubberized Nylon Fuel Tank

The Civil Aeronautics Administration has unveiled a new airplane fuel tank which will not burst and catch fire in crashes up to a certain speed. The tank is made of rubberized nylon cloth and is the product of five years' research by the C.A.A. test laboratories in cooperation with the U. S. Rubber Co. and the Goodyear Tire & Rubber Co. The tank is designed to hold tight in a crash in which passengers might survive the impact itself. It would eliminate from such crashes the gasoline fires which take so many lives, according to the team of scientists who developed it. The new tank is up to three times heavier than the conventional bladder-type tank and for this reason might not be acceptable for military planes, which must conserve weight. It differs from the bullet-sealing tank in military planes which has layers of a compound that swell to close bullet holes. The crash-resistant cell is designed not to break, so there would be no holes to seal.

Belt Gets X-Ray Check-Up

After hauling more than 8,000,000 tons of iron ore on the Mesabi iron range over a seven-year period, a rubber conveyor belt produced by the B. F. Goodrich Co., has now been given another on-the-job X-ray check-up. One of the world's first major steel cable belt installations, the conveyor belt was installed at a mine at Hibbing, Minn., in 1948. X-rayed every year since, the latest check-up showed the pioneer installation to be in excellent shape for many more years of use. According to the company's Industrial Products Division, no steel conveyor belt made endless by its patented splicing method has ever had a splice failure. The Hibbing mine belt is said to be the only belt of its service age, regardless of manufacture, that has never required splice repair or replacement. The conveyor belt operates at 30,000 pounds tension and travels 590 feet a minute.

Photoelectric Ozone Detector

An automatic photoelectric instrument for continuous measurement of the ozone in the earth's atmosphere at low altitudes has been developed at the National Bureau of Standards under the sponsorship of the Ordnance Department of the U. S. Army. Devised by R. Stair, T. C. Bagg, and R. G. Johnston of the Bureau's radiometry laboratory, the system makes use of the optical absorption characteristics of ozone in certain ultraviolet spectral bands. It is expected that the NBS development, which can determine ozone concentrations of a few parts per billion, will provide valuable information on air-mass movement and other weather phenomena. Other possible applications include the correlation of the visible deterioration effects of ozone on rubber with accurate measurements of ozone concentration in the atmosphere.

Central Can Co., Chicago, Ill., has appointed the A. C. Mueller Co., Cleveland, Ohio, as sales representative in the Cleveland and northern Ohio area.

Biggs Boiler Works Sold

Control of the Biggs Boiler Works Co. of 1007 Bank Street, Akron 5, Ohio, has been secured by Sydney L. Albert and associates through the purchase of Biggs' stock. The Biggs plant in Akron contains about 110,000 square feet of floor space and employs approximately 75 persons. Mr. Albert stated that he has extensive plans for revitalizing the Biggs operation which will lead to an enlarged labor force and the creation of new job opportunities. These plans involve the reorganization of management and institution of an intensive sales program. Considerable work will be brought to Biggs, he added, that is now being done by outside companies for the various Albert enterprises. Founded in 1887, Biggs was involved in a long legal battle after the firm was sold in 1948 to eastern industrialists by Byron R. Barder who, for nearly half a century, was one of the principal owners. The court fight developed between the new owners. Eventually, T. E. Krizanek was made president with Byron H. Martin as executive vice-president and secretary. Originally established to build boilers and steam generators, Biggs now produces vulcanizers and devulcanizers, rotary bleaching boilers and digesters for the paper industry, pressure vessels, etc.

Enjay Plans Butyl Marketing

Enjay Co., Inc., New York, N. Y., has announced plans for the marketing of Butyl rubber based on the expectation that the prospective sale of the Butyl plants at Baton Rouge, La., and Baytown, Texas, to its affiliates, Esso Standard Oil Co. and Humble Oil & Refining Co., will be completed during the second quarter of 1955. In this connection, Enjay intends to acquire the government's inventory at the time the plants are transferred so as to be in a position to continue without interruption shipment of the same grades of Butyl to consumers. Enjay intends to sell present grades of Butyl rubber at 23c a pound, f.o.b. the plants, in carload lots. Changes, if any, in present warehousing and on prices applicable to shipments from warehouses, will be announced at a later date. Enjay Butyl will be offered initially on the basis of prices firm for a calendar quarter on orders placed in advance of each new quarter. Technical service on Enjay Butyl applications will be provided by the Enjay Laboratories at Linden, N. J.

Stahl Forms New Division

Stahl Finish Co., Peabody, Mass., has announced the formation of a Polyvinyl Chemicals Division, with Max Potash as manager and Harold Naidus as director of development and sales. Mr. Potash was formerly chief engineer of the American Polymer Co., a division of the Borden Co., while Mr. Naidus was formerly research director for the same company. Stahl Finish states that the new division has been formed in order to expand its activities in the development and manufacture of synthetic polymer emulsions and solutions for the leather, paint, adhesives, paper and textile industries.

Clark Joins Dewey & Almy

Earl V. Clark

Earl V. Clark, formerly employed as a rubber chemist by the New Jersey Rubber Co. of Taunton, Mass., and by the Avon Sole Co. of Avon, Mass., has joined the Dewey & Almy Chemical Co., Cambridge, Mass. In his new capacity, he will do customer service rubber compounding, Bruce Bare, manager of the Organic Chemicals Division, stated. As a member of the organic products applications research laboratory, Mr. Clark will work with the company's various copolymers used by the rubber industry. He is a graduate of Boston College with a B. S. in chemistry.

Snell Buys Crippen & Erlich

Dr. Foster Dee Snell has announced the purchase by Foster D. Snell, Inc., chemical and engineering consultants, N. Y., of the Crippen & Erlich Laboratories, Inc., of Baltimore, Md. Under the new ownership, Raymond C. Crippen will continue as secretary-treasurer of the corporation and director of the laboratory which will operate for the present as a wholly-owned subsidiary of Foster D. Snell. The other officers of the new subsidiary will be Dr. Foster Dee Snell as president, and Dr. Chester A. Snell as vice-president. The Baltimore laboratories include an analytical laboratory, an instrument laboratory, a fuel and oil testing laboratory, an organic laboratory, a paint and varnish laboratory, a small machine shop, pilot plant, and metal analysis and corrosion testing laboratory.

Chicago Hears Stevenson

Approximately 300 members and guests of the Chicago Rubber Group attended the meeting held on February 18 at the Furniture Mart in Chicago, Ill. Principal speaker at the meeting was A. C. Stevenson, assistant director of the rubber laboratory, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., Mr. Stevenson spoke on "New Polymers and Some Potential Uses." The speaker discussed some of the properties of the polyurethanes and presented information on isocyanate reaction products that are foamed in place and cured at room temperature into resilient, semi-rigid and rigid end products.

Cuts Polyester Chemical Prices

An immediate price reduction of six cents a pound for special grade polyester chemicals used in the manufacture of new-type plastic foams has been announced by the Mobay Chemical Co., St. Louis, Mo. J. D. Mahoney, general manager of sales for Mobay, said that "Multron R-18," specially compounded for combining with isocyanates to form fully elastic foams, would now sell for 59 cents a pound in 20-drum quantities. Previously, the price has been 65 cents a pound. Similar price reductions were made for the resin in smaller quantities. Multron R-18 and other special polyesters for combining with isocyanates are now being manufactured by Mobay at Anniston, Ala., in an interim plant. Until now, the polyester has been imported from Germany. Mr. Mahoney said the price reduction was made possible by increased production facilities being placed in operation at Anniston. Mobay now is building a full-scale production plant at New Martinsville, West Va., for the production of both polyesters and isocyanates. Mobay, which was formed last year, is owned jointly by the Monsanto Chemical Co. and Farbenfabriken Bayer, A.-G., of Leverkusen, Germany.

Recent Carbide Appointments

Dr. A. B. Steele has been appointed manager and C. P. McClelland has been appointed assistant manager of technical service for the Carbide and Carbon Chemicals Co., New York, N. Y. The newly-created technical service group will be responsible for rendering special technical assistance to Carbide's customers. Dr. Steele joined Carbide's Fellowship at Mellon Institute in Pittsburgh, Penna., as a trainee in 1941 after graduating from the University of Wisconsin. He was appointed Senior Fellow in 1950. Dr. Steele's headquarters will be in the New York offices of the Company. Mr. McClelland joined Carbide's Fellowship at Mellon Institute in Pittsburgh, Penna., as a sales trainee in 1936. He was appointed a product manager in the Fine Chemicals Division in 1944 and has been responsible for the market development of "Tergitol" surface-active agents, "Carbowax" polyethylene glycols, and "Cellosize" hydroxyethyl cellulose.

Polyethylene Plant in Operation

Union Carbide and Carbon Corp., New York, N. Y., has announced that its new polyethylene plant at Seadrift, Texas, has been put into full operation, increasing the industry's production by what is said to be by more than 25%. Company officials state that this plant will add a rated capacity of 60,000,000 pounds to the industry's production—more than the entire industry produced in 1950. Seadrift makes the third polyethylene plant that Union Carbide has in operation, and a fourth is scheduled to go into operation at Torrance, Calif., in about a year. In addition to the original plant built at South Charleston, West, Va., in 1943 and since expanded to a rated annual capacity of 70,000,000 pounds, a 60,000,000 pound plant at Texas City, Texas, went into operation at the end of 1953.

FINANCIAL NEWS

GOODYEAR 1954 SALES DECLINE; NET PROFIT SET AT $48,055,196

Operations of the Goodyear Tire & Rubber Co., Akron, Ohio, in 1954, resulted in a net income of $48,055,196, equal to $5.04 a common share. The earnings were the second highest in the company's history, exceeded only by 1953's record of $49,323,167, equal to $5.10 a share. Consolidated net sales in 1954 amounted to $1,090,094,050, a decline of 10% below the $1,210,508,783 recorded in 1953. Share earnings for both periods were computed on the 9,106,608 shares of common stock now outstanding after a two-for-one split of the common stock last year.

The report said the lower sales volume reflected lower production of automobiles, some shrinkage in defense business, and a complete shutdown of Goodyear plants for nearly two months in the summer of 1954 because of a strike.

Sales in other parts of the world increased last year, especially in the British Empire and Western Europe. This increased volume in Europe reflected business recovery from the effects of the war, P. W. Litchfield, chairman of the board, stated.

Capital expenditures for expansion, improvements and replacements in 1954 were $33,076,180, which amount was more than covered by depreciation provided during the year of $33,831,081. Inventories in 1954 were $249,388,898, against $245,982,867 a year earlier.

Because of the retirement of preferred stock last year, which required an outlay of $59,288,145, working capital was reduced to $362,054,380 at the end of 1954, compared with $401,465,369 at the end of 1953.

Mr. Litchfield announced that Goodyear had arranged with a group of insurance companies for a 100-year loan of $50,000,000 to provide funds for expansion purposes. The money will be lent on 3¼% unsecured notes to be purchased by June 30. The company has canceled $50,000,000 of a $100,000,000 revolving credit which expires in 1957.

The new 100-year notes will be subject to voluntary repayment at the option of the company, but will involve no required sinking fund payments or new restrictions on common dividend payments. They will be convertible in certain contingencies to shorter term, lower rate notes.

Provision for foreign and domestic taxes in 1954 declined to $43,372,000 from $68,449,753 a year earlier. In addition, excise taxes on tires and tubes in 1954 amounted to $53,558,513.

Take a long time for this copy of RUBBER AGE to reach your desk? Use the coupon on page 961.

U. S. Rubber Reclaiming Co.

For 1954: Net loss of $156,651, compared with a net income of $126,181 in 1953. In 1954, the company reported a loss of $268,411 before income taxes, compared with a profit of $229,605 before income taxes in 1953. Income taxes reflected a credit of $111,760 in 1954, while income taxes in the previous year amounted to $103,424. In the quarter ended December 31, 1954, the company showed a profit of $9,426 before income taxes, income taxes of $5,025, or a net profit of $4,401. In the quarter ended December 31, 1953, the company showed a loss of $56,145 before income taxes, a tax credit of $46,776, or a net loss of $9,369.

Plymouth Rubber Co.

Year Ended November 30: Net income of $422,335, which is equal to 47c a common share, compared with a net income of $225,164, or 25c a share, in the preceding year. In the year ended November 30, 1954, net sales amounted to $15,058,430, contrasted with $15,739,908 in the year ended November 30, 1953.

Dayton Rubber Co.

Quarter Ended January 31: Net profit of $416,671, which is equal to 67c a common share, compared with $155,936, or 23c a share, in the first fiscal quarter of 1954. Consolidated sales in the quarter ended January 31, 1955, totaled $14,252,951, contrasted with $12,030,814 in the quarter ended January 31, 1954.

Armstrong Cork Co.

For 1954: Net profit of $11,913,676, which is equal to $7.34 a common share, compared with $9,264,978, or $5.84 a common share, in the previous year. Net sales for 1954 amounted to $217,557,305, compared with $217,484,369 in 1953. This report covers the company and domestic subsidiaries.

Aetna-Standard Engineering Co.

Six Months to December 31: Net income of $410,818, which is equal to $1.02 a share, compared with $671,439, or $1.75 a share, in the same period of the preceding year. Sales for the 1954 period amounted to $9,730,000, compared with $14,200,000 in the six months ended December 31, 1953.

Johns-Manville Corp.

For 1954: Consolidated net earnings of $16,655,658, which is equal to $5.24 a share, compared with $19,661,412, or $6.20 a share, in 1953. Sales for 1954 amounted to $253,151,584, compared with $252,642,136 in 1953.

GOODRICH 1954 SALES DECLINE; NET INCOME SET AT $38,815,737

Sales of the B. F. Goodrich Co. for 1954 totaled $630,670,600, compared with $674,613,276 in 1953, a decline of 6.5%, but net income increased to $38,815,737 from $34,226,745, John L. Collyer, chairman, and William S. Richardson, president, disclosed in the company's annual report. The 1954 net was equal to $4.40 a share on 8,812,260 shares of common stock, compared with $4.08 a share on 8,388,500 common shares for 1953. Figures for both years reflect the two-for-one stock split effected December 14, 1954.

Net income for 1953 was after a reserve of $2,000,000 for increased replacement cost of facilities. Direct and indirect sales to the Federal government declined to 8.3 from 14.1% between 1953 and 1954, the report noted. Net income for 1954 was increased by $1,035,000 owing to deductions for accruals of estimated expense permitted under the revised internal revenue act.

Federal and foreign income taxes and liability for renegotiation for 1954 were $36,474,000, compared with $53,863,000 in 1953 and total taxes were $74,208,000, against $93,480,000, or equivalent respectively to $8.42 and $11.14 a common share. Depreciation and amortization increased to $16,121,656 from $13,435,913.

Capital expenditures for expansion and improvement of facilities last year totaled $28,028,000, exclusive of $16,146,000 paid in common stock for the assets and business of Sponge Rubber Products Co. Capital outlays for 1953 were $23,420,000. Current assets at the end of 1954 were $319,048,371 and current liabilities $93,415,671, a ratio of 3.4 to 1. Net working capital increased to $225,632,754 from $210,370,067. Inventories were reduced from $128,322,649 to $121,574,285.

Directors declared a quarterly dividend of 45c on common, payable March 31, compared with 40c quarterly paid last year.

American Enka Corp.

For 1954: Net income of $5,010,382, which is equal to $4.48 per share, compared with a net income of $6,410,939, or $5.74 a share, in 1953. Sales in 1954 amounted to $59,692,723, contrasted with $65,106,610 in the preceding year.

Sheller Manufacturing Corp.

For 1954: Net profit of $2,726,698, which is equal to $2.86 a share, compared with $3,187,114, or $3.34 a share, in the preceding year. Net sales for 1954 amounted to $37,164,986, compared with $46,704,575 in 1953.

Allen Industries, Inc.

For 1954: Net profit of $1,265,178, which is equal to $2.26 a share, compared with $1,078,300, or $1.93 a share, in the preceding year. Net sales for 1954 amounted to $34,103,459, compared with $32,650,026 in 1953.

GENERAL TIRE 1954 NET SALES HIT RECORD OF $216,986,110

Net sales of the General Tire and Rubber Company for the year ended November 30, 1954, increased 5.7% above the previous year's volume. General Tire had record sales of $216,986,110 for fiscal 1954, according to the annual report released by William O'Neil, president. This represents an increase of $11,615,012 above the $205,371,098 volume cleared a year earlier.

Net profit was $5,879,500 equal to $4.30 a share. This includes an unconsolidated income of $1,376,855 as the company's share in the earnings of General Teleradio, Inc., and other subsidiaries. For the year ended November 30, 1953, net profits were $7,431,802, equal to $5.87 a share. Included in earnings for 1953 was $1,207,321 as the company's share in the radio and television net income.

Accompanying the earnings report was an announcement that General Tire had filed a registration statement with the Securities and Exchange Commission covering the proposed sale of $10,000,000 of preferred stock. This would involve the issuance of 100,000 shares of cumulative preferred stock at $100 a share. The preferred issue is convertible into common stock. The dividend rate and conversion terms were not announced. Proceeds of the offering will be added to the general funds of the company and will be used primarily for working capital, Mr. O'Neil said.

The record 1954 sales figures included sales of the Canadian subsidiary but do not include sales of affiliates in Mexico, Europe, South America or South Africa, or those of General Teleradio. If General Tire's equity in earnings of unconsolidated foreign subsidaries and affiliates were included net profit for 1954 would be equal to about $6.00 a share.

The board of directors has issued a redemption notice for the 2,771 shares of 3¼% second preferred stock outstanding, Mr. O'Neil said.

Lee Rubber Approves Stock Split

At their recent annual meeting in New York City, stockholders of the Lee Rubber & Tire Corp. approved a proposal to split the company's common stock three-for-one. A. A. Garthwaite, president, stated that the dividend rate on the split shares would have to be decided by the board of directors.

Industrial Rayon Corp.

For 1954: Net income of $7,404,829, which is equal to $4.01 per share, compared with a net income of $8,633,700, or $4.68 per share in 1953. Net sales in 1954 amounted to $65,916,451, contrasted with $70,301,603 in 1953.

Rome Cable Corp.

Nine months to December 31: Net income of $644,000, which is equal to $1.25 a common share, compared with $1,259,000, or $2.52 a common share, in the same period of the preceding year.

Snow-White Rubber Lining

One of the first tanks lined with a new white rubber compound developed by the B. F. Goodrich Industrial Products Division, Akron, Ohio, is this 3,100-gallon tank for processing a special high quality, water-white, food-grade, phosphoric acid.

The white rubber compound was specially developed to resist discoloration of the acid which is used in the preparation of many food products. The one-quarter inch sheets of rubber are rolled firmly into place over a rubber adhesive which bonds the rubber to the metal.

AMF Plans Nuclear Reactor

American Machine and Foundry Co., New York, N. Y., has completed plans for the building of the first nuclear reactor to be owned and operated by private industry for research in industrial and humanitarian fields. A number of leading industrial concerns have been invited to participate in the program on a cooperative basis. Meetings to implement the program are now in progress. In addition to building the reactor, AMF will be one of the participants in the program. The first reactor, and its supporting laboratory facilities will cost between $1,000,000 and $1,500,000 and can be constructed and available for use within 18 months. It is planned that the facility will be built in the New York area on a site of approximately 250 acres.

Goodyear Fendering in Use

What is said to be the largest oil dock in Great Britain recently opened close by the ancient village of Eastham in Cheshire on the Manchester Ship Canal. Each of the four berths at the dock is fitted with fendering produced by the Goodyear Tire & Rubber Co. The fendering is 15 inches in diameter and comes in 10-foot lengths. Each length is suspended by steel cable spliced on to ring bolts mounted in recesses in the dock wall. As a tanker's pumps discharge oil, the ship rises in the water. The round Goodyear Fender then acts as a resilient roller, moving up the dock walls and maintaining its full fendering action irrespective of draft—yet not suffering any chafing. The fendering, being in units, may be rearranged to meet changing conditions.

SEIBERLING 1954 SALES DROP; EARNINGS DECLINE 79 PERCENT

In its annual report to stockholders for 1954, the Seiberling Rubber Co., Akron, Ohio, reported that 1954 sales had dropped 11% from 1953 figures, while earnings had declined by 79%. Net sales in 1954 amounted to $35,714,299, compared with $40,351,305 in 1953. Net earnings in 1954 were $215,789, against $1,035,740 in 1953. After preferred dividend requirements, net earnings in 1954 amounted to 2c a share, contrasted with $2.10 a share in 1953.

At the end of 1954, cash totaled $1,328,588, and current asset were $14,831,621, and current liabilities were $4,682,900, a ratio of 3.2 to 1. Working capital was down $930,694 to a year-end total of $10,148,721, mainly because of plant expenditures which are part of the company's diversification program. These included a new plastics plant, a newly-leased mat plant, part of the cost of a tire plant at Bogota, Colombia, a Canadian plant addition, and new equipment for Seiberling's tire and heel plants.

J. P. Seiberling, president of the company, attributed the drop in 1954 sales and earnings to a "price war" in the replacement tire market. But the future looks better, he said, for two reasons: (1) The replacement tire market has improved in 1955, "and we should recover much ground lost in the past year"; and (2) The company is diversfying its output to depend less on the replacement tire field in the future.

Silicone Tanned Leather

Charles A. Eaton Co., Brockton, Mass., and the Endicott Johnson Shoe Corp., Endicott, N. Y., will soon be offering shoes made of "Sylflex" leather. A new concept in leather, Sylflex is a special Dow Corning silicone product that is tanned-in to make shoe upper leather exclude water, stay soft and flexible and still "breathe." Officials of Dow Corning describe Sylflex as the result of combining the proper silicone and proper types of leather to perform according to quality control standards set up by Dow Corning and leading tanneries. Sylflex is applied in the tannery so that every fiber is surrounded with a permanently water repellent silicone film. A new and larger leather testing and research laboratory is being opened by Dow Corning in Midland, Mich., to permit more intensive development of silicones for the leather industry and more extensive cooperation with tannieries and shoe manufacturers.

Armstrong Cork Plans Stock Split

Directors of the Armstrong Cork Co., Lancaster, Penna., have recommended that the common stock of the company be split three-for-one effective April 27, 1955. Shareholders will be asked at the annual meeting on April 25 to increase the authorized common stock to 15,000,000 shares of $1 par value, from the currently authorized 2,000,000 shares without par value. At the end of 1954, the company had 1,601,555 shares of common stock outstanding.

NEWS IN BRIEF

Four new colors in .080 residential all-vinyl flooring and four new styles in the H.D.H. all-vinyl flooring line have been introduced by the Flooring Division of the Goodyear Tire & Rubber Co.

Flexible vinyl grips, made by Hungerford Plastics Corp., Rockaway, N. J., are a feature of the Metal Master line of aviation-type compound action snips manufactured by J. Wiss and Sons Co., Newark, N. J.

Marblette Corp., Long Island City, N. Y., is distributing a permanent reference folder for filing data on Marblette Epoxy Resins. Address requests to the company.

Dow Corning Corp., Midland, Mich., has issued the 1955 Reference Guide listing its silicone products and their applications.

National Vinyl Products, Redwood City, Calif., is distributing a new, cement floor coating, based on Bakelite vinyl resins, designed to permit easy pickup of oil, grease and dirt.

Robbins Tire & Rubber Co., Inc., Tuscumbia, Ala., is producing easy-to-install street markers made of Bakelite vinyl resins.

Lowe Paper Co., Ridgefield, N. J., and Permacel Tape Corp., New Brunswick, N. J., are producing strong paper and tape coated with Bakelite polyethylene for lining concrete forms.

Oak Rubber Co., Ravenna, Ohio, is marketing its multi-color, pear-shape and tear drop size penny balloons in a handy, pull-out drawer dispenser.

Dajac Laboratories, Leominster, Mass., has recently published a complete literature review on "2,4,7-Trinitrofluorenone", the company's new reagent for polynuclear ring systems.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has issued a technical report entitled "Neoprene Latex Addition to Paper in the Laboratory." Write to the DuPont Elastomers Division for Report PR-7.

Adhesive Products Corp., New York, N. Y., has developed a flexible tile cement called "Adco" for do-it-yourself tile installations on wood, plaster or metal surfaces.

Bowman, Inc., Little Rock, Ark., has announced plans to manufacture three models for the outboard motor boat market using a new leakproof, seam-free Fiberglas hull developed by the Goodyear Aircraft Corp.

Anaconda Wire & Cable Co., New York, N. Y., has released a publication titled "New Catalog Section on Soldersealed Potheads". Ask for publication No. C-79-1330.

Results of a research program at Cornell University indicate that neoprene milking machine inflations will last twice as long as inflations made of natural rubber and, in addition, provide better sanitation and milk faster.

The Adhesives and Coatings Division of Minnesota Mining has developed a new rubber-base adhesive for installing floor tile. Called "3M Brand CTA-12", the adhesive is a soft mastic packaged in cans ready for instant use.

Carradan Associates, Chicago, Ill., is producing a bubble-shaped inflatable lamp from translucent Krene. The lamp hangs from the ceiling and can be raised or lowered by pulling on the lamp cord.

Packaging paper treated with Hycar nitrile latex prior to printing and waxing is reported to provide a superior printing surface, improved moisture resistance, greater flexibility, opacity and whiteness.

Stretchable Krene ribbon-ties, ready-made to snap around gift boxes, are available from the Rapid Ribbon Corp., Croton-on-Hudson, N. Y.

Adhesive Products Corp., New York, N. Y., is making a new, pressure sensitive adhesive, "Prestix", which can be applied to paper, leather, metal, plastic and other surfaces to make them self-sticking.

Bell Kaolin Co., Batesberg, S. C., has added a new 19-B Bucyrus shovel to its production facilities.

I. B. Kleinert Rubber Co., New York, N. Y., has received the Morris H. Palmer award for leadership in progressive industrial management from the Queens County Management Club, an affiliate of the National Association of Foremen.

A bulletin on Harshaw Vinyl Stabilizers for the vinyl, plastics and coating industries has been issued by Harshaw Chemical Co., Cleveland, Ohio. Request Bulletin No. VP-1.

Automobile Manufacturers Association has published the 1954 edition of "Motor Truck Facts", an annual statistical publication of the AMA, containing 56 pages of charts and tables.

The 1955 edition of the booklet, "Physical Properties of Synthetic Organic Chemicals," has just been issued by the Carbide and Carbon Chemicals Co., New York, N. Y. Ask for Booklet F-6136.

Panelfold Doors, Inc., Hialeah, Fla., is manufacturing accordian-type folding doors constructed of 3½-inch natural wood panels hinged together with flexible strips of Geon vinyl plastic.

Logo, Inc., Chicago, Ill., has issued a bulletin covering static electricity and dust control on plastics. Request Technical Service Bulletin No. 1.

Glyco Products Co., Inc., Brooklyn, N. Y., will move on March 1st to the Empire State Building, New York, N. Y. The new telephone number is OXford 5-5140.

Godfrey L. Cabot Research Laboratories, Cambridge, Mass., has issued a bulletin on "Sterling V and Vulcan 6 in Passenger Tire Compounds". Request Technical Service Laboratory Bulletin No. GD-10.

Flexible Products Co., Marietta, Ga., has acquired rotational molding equipment to assist customers in selecting compounds for given applications and for use in sample production or product and mold development.

Since the inception of its suggestion award program in 1918, Firestone has paid out $903,000. Employees have submitted 178,000 suggestions of which over 53,000 have been adopted.

The Chemical Division of Goodyear has released a technical guide on Pliovic EDB90V electrical grade resin. Request Techni-Guide PVR-100-8.

A new synthetic detergent of the alkylolamide type is being marketed by Mona Industries, Inc., Paterson, N. J., under the name "Monamine ADD-100". Request Technical Bulletin No. 217.

"Reinforced Plastics" is the title of the 39th bulletin in the "Technical Aids for Small Manufacturers" series issued by the Small Business Administration, Washington, D. C. Copies available upon request.

Carbide and Carbon Chemicals Co., New York, N. Y., has announced a price reduction of 20c per pound on Cellosize hydroxyethyl cellulose.

Anaconda Wire & Cable Co., New York, N. Y., has re-issued its Magnet Wire Catalog in convenient, pocket-size form. Request Booklet C-79-12A.

Eastman Machine Co., Buffalo, N. Y., has moved its New York office to 315 West 35th St., New York 1, N. Y.

"Marforge Moves the Nation's Goods" is the title of a new, 6-page bulletin dealing with Hand Lift Trucks and Hand Pallet Trucks issued by Market Forge Co., Everett, Mass. Request Bulletin No. 1005-A.

Lexsuco, Inc., Cleveland, Ohio, has developed a new roof construction utilizing a "Vapor Barrier" of Koroseal, a flexible material manufactured by Goodrich, which eliminates all combustible materials between roof deck and insulation.

Rubber in Shipbuilding

On June 15, 1954, a conference on "Rubber in Shipbuilding" was held in Oslo, Norway, under the sponsorship of the Scandinavian Section of the International Rubber Office. The International Rubber Office is a branch of Rubber-Stichting, Delft, Netherlands. The conference was held in cooperation with the Naval Architects and Marine Engineers Section of the Institute of Norwegian Engineers. The papers presented at the conference have now been published in "European Shipbuilding" Postbox 162, Oslo, Norway. The papers presented at the conference included the following:

"The Use of Rubber Latex Cement Compositions in Ship Construction" by L. H. Griffiths, London, England.

"Rubber in Valves" by J. B. Ratelband, Delft, Netherlands.

"Reduction of Shipboard Vibration by Rubber Units" by J. Nicolaisen, London, England.

"Resilient Couplings in Ships' Main Machinery" by W. Schach, Unna, Germany.

Further details are available from the Scandinavian Section of the International Rubber Office, Riddargatan 23b, Stockholm, Sweden.

Reports on Rubber Course

The Philadelphia Rubber Group reports that the course in basic rubber technology which it is offering in conjunction with Villanova University got under way on February 7. The enrollment for the course was 169, with 25 applicants held over until the Fall semester because of space limitations in the lecture hall. Villanova has made this course a part of their evening division chemical engineering curriculum. Of the 169 persons taking the course, 42 are taking it for credit. All the participants will be asked to turn in a term paper. A committee from the Philadelphia Rubber Group will judge the best paper, the writer of which will be awarded with a $100 Savings Bond by the group. It is also the intention of the group to solicit funds and to print the series of lectures in book form at the end of the first semester.

Dewey & Almy Buys Plant Site

Dewey & Almy Chemical Co., Cambridge, Mass., has purchased a 200-acre site near Greenville, S. C., for construction of a plant to manufacture "Cryovac" plastic bags. Construction will begin immediately and the plant is expected to be in operation by mid-summer. The plant will be of one-story construction and will have complete facilities for extruding, bag fabrication, and four-color printing. Its capacity will be approximately equal to plants at Lockport, N. Y., and Cedar Rapids, Iowa. These two plants have recently been expanded and improved. The Greenville plant will employ between 300 and 400 persons when in full operation.

Writing RUBBER AGE? After March 18, 1955, our new address will be: 101 W. 31st St., New York 1, N. Y. New telephone number: PEnnsylvania 6-6872.

Bullock Named Representative

H. Leslie Bullock

C. A. Litzler Co., Inc., Cleveland, Ohio, has announced the appointment of H. Leslie Bullock as district sales engineer. Mr. Bullock will cover the metropolitan New York and New England territory from his headquarters at 136 Liberty St., New York, N. Y. A licensed professional engineer in the State of New York, Mr. Bullock attended Columbia University, and has been active in the American Society of Mechanical Engineers, the Society of the Plastics Industry and the National Panel of Arbitrators of the American Arbitration Association. For the last twenty-two years, Mr. Bullock has been a well-known New York consulting engineer, having dealt in many problems on coating, mixing and continuous processing equipment. The C. A. Litzler Co. builds specially engineered coating and impregnating machinery and equipment for such end products as tire cord fabric, artificial leathers, impregnated and coated fabrics and papers, and insulated electrical wire and cable.

Data on Atlas Steel Rule Die

Some pertinent information on the Atlas Steel Rule Die Co. of 1700 Waurika, Elkhart, Ind., has recently become available. The company was originally founded in 1947 by R. B. Van Der Karr, offering a steel rule die service to the rubber, printing and other industries. In October, 1952, a partnership was formed by S. Ray Miller, Jr., and Mr. Van Der Karr. In the spring of 1953, a new and modern plant was completed and in 1954, Mr. Miller purchased his partner's interest in the firm. Atlas Steel Rule Die Co. is now in a position to offer complete cutting die service to industry.

Named Eastern Sales Manager

Charles Loring has been named eastern district sales manager of the Industrial Chemicals Division of the Stauffer Chemical Co., New York, N. Y. In this capacity, he will be in charge of industrial chemical sales in New England, the Central Atlantic and Southeastern states. Gifford A. Acker will take over Mr. Loring's previous responsibilities in the eastern territory.

Testing Laboratory Directory

The American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Penna., has announced publication of the "Directory of Commercial and College Testing Laboratories". This 48-page, paper-covered book, is available for $1.00 and is a successor to the "Directory of Commercial and College Laboratories" published in 1947 by the National Bureau of Standards, U. S. Department of Commerce, as Miscellaneous Publication M-187. Responsibility for the compilation and publication of the directory has been transferred from NBS to ASTM by agreement between the two organizations. The Directory lists the locations of testing laboratories equipped and prepared to undertake testing on a commercial or fee basis. Information is given concerning 278 commercial testing laboratories and their 151 branches or offices. There is also presented a list of the laboratories of 86 colleges that are prepared to do testing under certain conditions. Research and consulting laboratories are not listed unless they are engaged in testing on a commercial basis.

Rubber Compounds On Approval

Foster D. Snell, Inc., New York, N. Y., is inaugurating a "compounds-on-approval" service. In operation, interested parties inform the Snell company of their interests in compound development or improvement. Foster D. Snell will return a description (pertinent properties and raw material costs) of a compound which is believed to fill the requirement. In addition, the Snell company will send a laboratory batch of the compound "on aproval." If the compound is satisfactory, the formula and processing directions may be purchased. If the compound is not the immediate answer to a problem, the Snell company will undertake the necessary development work on a job or retainer basis. This on-approval method, the company states, will provide two advantages: (1) A means by which a client can obtain a more efficient and rapid return for his research dollar than ever before, and (2) A means by which Foster D. Snell, Inc. can make maximum use of their extensive experience in solving the problems of elastomer technology.

Butyl Rubber Plant for France

According to reports from Paris, a company to produce Butyl rubber in France will shortly be formed. The company, to be called Societe du Caoutchouc Butyl, will be founded by ten prominent firms, comprising two petroleum companies, three tire manufacturers and five chemical companies. A plant for the production of Butyl will be constructed in the Rouen area. It is being planned with an annual capacity of 20,000 tons of Butyl and operations are expected to start in 1957. Isobutyl required by the new plant will be supplied by the two petroleum companies, Esso Standard and Compagnie Francais de Raffinage. It is stated that the new company will be able to produce its rubber at world prices and will make France independent of imports, which now come from the dollar area. The dollar savings are estimated at $5,000,000 annually.

N.Y. Executive Committee Meets

The first meeting of the 1955 officers and Executive Committee of the New York Rubber Group was held recently at the Henry Hudson Hotel in New York City. Neil Catton (DuPont) was present as the contact between the Liaison Committee of the Division of Rubber Chemistry, A.C.S., and the New York and other groups, to determine means for strengthening the relationships of the various groups and to promote activities designed to increase their activities. In other discussions at the meeting, it was suggested that the New York Rubber Group consider the setting up of lecture courses on rubber technology in one or several representative educational institutions in the New York area and to endeavor to provide speakers of standing to carry on a series of lectures on selected subjects, as have other rubber groups. Dr. C. V. Lundberg (Bell Laboratories) was appointed chairman of the committee to make such a study, to contact the membership for suggestions, and to report back to the group. It was agreed that the Spring and Fall technical meetings be held on April 1 and October 7 and the Christmas Party on December 9, all at the Henry Hudson Hotel. G. H. Provost (U. S. Rubber) is in charge of arranging for the programs, two papers at the April meeting, and a panel discussion in October. The Annual Outing will be held on June 9 at Doerr's Grove, Milburn, N. J., under the chairmanship of M. R. Buffington. The Annual Golf Tournament will be held in August at a place to be selected. G. H. Provost, C. O. Davison (Binney & Smith) and Joseph Breckly (Titanium Pigment) will be the committee in charge.

Borden Acquires Chemical Firms

The Chemical Division of the Borden Co. has acquired the American Monomer Corp. and Monomer-Polymer, Inc., both of Leominster, Mass. American Monomer, said to be one of the country's largest producers of polyvinyl alcohol, also manufactures a broad line of solid thermoplastic resins, as well as specialty monomers and cross-linking agents. Monomer-Polymer engages in research on thermoplastic materials and also makes specialized monomers and polymers for research use. Borden states that the acquisition of the two companies is in line with its policy of expanding its activities as a producer of thermoplastics and in the thermosetting field in general. The acquisitions give Borden the broadest and most varied thermoplastic and thermosetting line in the country, the company added.

Enters Agreement With Chiksan

Food Machinery & Chemical Corp., San Jose, Calif., has entered into an agreement with the Chiksan Co. of Brea, Calif., under which Food Machinery will offer to exchange one of its shares of common stock for 2.30 shares of Chiksan common. Chiksan, manufacturer of specialized pressure-type swivel joints used in the petroleum and other industries, will become the Chiksan Division of Food Machinery.

LOS ANGELES NEWS

The March 1 technical meeting of the Los Angeles Rubber Group which was to have been held at the Hotel Statler in Los Angeles, Calif., was to have been addressed by T. H. Rogers, head of the Airfoam Research Section of the Goodyear Tire & Rubber Co., Akron, Ohio. Mr. Rogers was to have spoken on "Elastomeric Foam Materials." The speaker was to have given a review of the latex foam industry showing the market growth of the product and into what consumer items the material has been successfully applied. The use of synthetic latex in foam production was also to have been discussed.

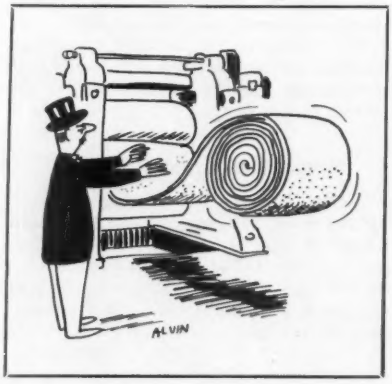
The newer foams, such as the polyurethane and vinyl materials, were to have been considered and a comparison made of the properties of the various foams. Mr. Rogers' talk was to have been accompanied by slides depicting the physical properties of the foams in both graph and table forms. Samples of the various types of foam were to have been displayed as well as the base materials from which the foams are prepared.

The non-technical portion of the meeting was to have been addressed by Dr. Russell B. Lindskog, noted scientist and world famed lecturer. Dr. Lindskog was to have spoken on the subject, "Atomic Energy in the Coming Era." A complete report on the March 1 meeting will appear in a future issue of RUBBER AGE.

H. R. Painter, executive vice-president and treasurer of the Midwest Rubber Reclaiming Co., East St. Louis, Ill., has been appointed general manager of the Paramount, Calif., plant of the company. He retains his positions as executive vice-president and treasurer in addition to his new duties at Paramount.

Austin H. Herbst of the Irvington Varnish & Insulator Division, Minnesota Mining & Manufacturing Co., Monrovia, Calif., has been elected national director of the Society of Plastics Engineers.

Bob Plank, formerly associated with the Ace Rubber Co., South Gate, Calif., has joined the technical staff of the Fargo Rubber Corp., Los Angeles, Calif.



New Type Polyethylene Resin

A new type polyethylene resin with greater rigidity and higher temperature resistance is now in pilot plant production at South Charleston, West Va., according to an announcement by the Bakelite Co., New York, N. Y. This new resin increases the range of Bakelite polyethylenes and makes possible important new applications for this group of materials, the company said. Experimental quantities of the new polyethylene resin will be offered for use in the near future. Production will be increased as demand warrants. This new polyethylene resin is produced under conditions that approximate atmospheric pressure and temperature. Current types of polyethylene are normally produced at extremely high pressures and elevated temperatures. Softening points up to about 240°F. are indicated for the new type polyethylene. This higher softening point is a distinct advantage when contrasted with softening temperatures of 20 to 30 degrees Fahrenheit lower for conventional polyethylene resins. The higher temperature range is expected to open the way to new and expanded uses of polyethylene. The greater rigidity is advantageous in such fields as toys and large molded or vacuum-formed products.

Buys Metalead Products Corp.

Arthur B. Mullaly, president of the Advance Solvents & Chemical Corp., New York, N. Y. has purchased control of the Metalead Products Corp. of San Francisco, Calif. No merger between the respective organizations is contemplated at this time. Metalead produces lead flake and lead powder which finds use in the rubber, plastics, paint and other industries. Jerome L. Frankel, for many years traffic manager of Advance Solvents, has been named secretary-treasurer of Metalead and in this capacity will direct product sales and customer service activities. Mr. Frankel has also been appointed manager of West Coast operations for Advance Solvents. Eugene Dondero, who formerly assisted Mr. Frankel in the Traffic Department of Advance Solvents with headquarters at Jersey City, N. J., has assumed the duties of traffc manager.

Receives Colombian Appointment

Appointment of E. G. Balzano, plant engineer at the Seiberling Rubber Co., Akron, Ohio, as chief engineer of Productos de Caucho Villegas, S.A. of Colombia, was announced recently. Maxwell Cole, formerly chief power engineer at Akron, has been named to succeed Mr. Balzano as plant engineer. Mr. Balzano joined Seiberling in 1948 after 14 years' service with the Firestone Tire & Rubber Co. He was a master mechanic in Seiberling's Engineering Division before being named plant engineer in 1949. Mr. Cole has been with Seiberling since 1949 after being associated with the Parker Appliance Co. and the Aluminum Co. of America. Productos de Caucho Villegas, with a plant at Bogota, Columbia, is expected to be in production of tires by this summer.

RUBBER AGE

Is Moving!

After March 18, 1955

Palmerton Publishing Co., Inc., publishers of
RUBBER AGE and **RUBBER RED BOOK** will be located
in new and larger quarters at

101 West 31st Street, New York 1, N. Y.

The new telephone number will be: **PEnnsylvania 6-6872**

CANADIAN NEWS

Polymer Corp., Ltd., has included in its 1955 budget, $5,830,000 for expansion and improvement, company president J. D. Barrington announced recently. The budget, which has just been submitted to Defense Minister C. D. Howe, proposes commitments for new items, the largest of which is $3,000,000 for increased production "to meet expanding markets."

Mr. Barrington said that in addition to the 1955 total, there is a carry-over of $2,800,000 for projects started in 1954. As in all previous years, he said, these expenditures will be financed out of company earnings.

Mr. Barrington also pointed out that "such expenditures necessarily project themselves into 1956, or perhaps, 1957." One such example involves the installation of an additional turbo-generator in the steam and power plant, to meet Polymer's growing demand for electric power. Polymer is able to produce power for its own use economically because of its heavy requirements for process steam, it is stated.

Included in the program is the construction of a new cafeteria for the plant. While cost of this has not been estimated, it will completely replace the present building on No. 40 Highway, the future of which is as yet undecided.

New maintenance shop facilities and additions to technical service laboratories are also included. Largest item is the $3,000,000 to be spent on increasing production to help the government-owned synthetic rubber corporation meet its expanding markets.

Improvements to present production facilities will take $2,400,000. A substantial portion of this, says a company statement, will go toward additional sulfur removal facilities. A program is also under way to improve efficiency and employee working conditions, Mr. Barrington stated.

Gross value of production of Canada's rubber products industry rose in 1953 to $290,735,000 from $286,655,000 in the preceding year, but declined 6.7% from the all-time high of $311,678,000 in 1951, according to a recently issued annual industry report.

The rubber products industry, which comprised 72 establishments in 1953, employed 22,600 persons as compared with 21,582 in 1952 and paid them $70,994,643 in salaries and wages against $65,477,683. Cost of materials used in the year was $114,336,694 versus $120,799,295 a year previous.

The 72 establishments, manufacturing rubber tires, rubber footwear and other rubber goods, were located as follows: 39 plants in Ontario, 28 in Quebec, one in Manitoba, one in Alberta and three in British Columbia.

The industry is practically confined to the provinces of Ontario and Quebec. The plants of Ontario employed almost 72% of the persons engaged in the industry and produced over 81% of the entire output, while almost 28% of the total employment and over 18% of the production was in the province of Quebec.

Output of tires of all kinds in the year under review rose in number to 6,664,456 from 5,582,275 in 1952 and in value to $143,232,397 from $143,019,868, and inner tubes production increased to 5,219,511 from 4,425,318 and in value to $13,313,977 from $11,610,238.

Rubber footwear production was up slightly to 14,092,486 pairs from 14,040,272 but the value dropped to $35,916,401 from $39,108,674. The value of all other products rose to $98,272,684 from $92,915,849.

The board of directors of Phillips Electrical Co. (1953) Ltd., has announced the appointment of A. Lauder as vice-president (production and engineering). He was formerly works manager. Mr. Lauder joined the Eugene F. Phillips Co. in 1913 and installed the equipment for manufacturing the first paper insulated power cable made by this company. He became a senior plant officer in 1922 and has been works manager since 1934. Mr. Lauder belongs to several trade and engineering societies and has many friends in Canada, U.S.A. and Great Britain, including the Wire Association.

Following the appointment of A. Lauder as vice-president in charge of production and engineering, J. E. Thomas has been named general works manager of the Phillips Electrical Co. Mr. Thomas has been with the company since 1946, and has been production manager for the past few years. Before joining Phillips, Mr. Thomas had been with the Wire and Cable Division of the Canadian General Electric Co. for many years.

B. F. Goodrich Canada Ltd., will be the new name of the B. F. Goodrich Rubber Co. of Canada Ltd., according to an announcement by Ira G. Needles, president. "The change in name is designed to keep pace with our accelerated activities in the fields other than rubber, such as chemicals, vinyl plastics and rigid plastic material. At the same time, we recognized a need to streamline the company name and provide a shorter title," said Mr. Needles. He said permission to change the name had been received from the Secretary of State, and the new name would be effective immediately.

The Canadian Tariff Board on March 14 was to have heard an appeal from three rubber manufacturers against its recent findings in the special brand tire case involving the T. Eaton Co., of Toronto. In the hearing last November, the Board found that the T. Eaton Co. was not a producer or manufacturer of special brand tires and was not liable for tax on sales of such tires. The Board's finding added:

"In so far as any other special brand customer may have a relationship with his supplier which parallels that of the T. Eaton Co., he is not liable to account for tax on the sale of such 'special brand' tires."

It has now been claimed by counsel for Goodyear Tire & Rubber Co. of Canada, Firestone Tire & Rubber, and B. F. Goodrich Canada, Ltd., that, in taking this position, the Board is "shutting the door to a full assessment of the facts and the legal effect to be given thereto in all other cases."

On February 8, Harley O. Allman, plant manager of the New Toronto, Ont., plant of the Goodyear Tire & Rubber Co. of Canada, Ltd., celebrated his forty-fifth year with the company. At a party at the New Toronto plant attended by top officials of the company, Mr. Allman received his 45-year pin from R. C. Berkinshaw, president. Mr. Allman's continuous service dates from February 8, 1919, when he was employed at Akron in production supervision, a position he held until the fall of 1922 when he was transferred to New Toronto in a like capacity. On December 28, 1942, he was promoted to the post of plant manager.

Appointments at Monsanto Ltd.

Monsanto Chemicals Ltd., London, England, has announced that Dr. W. A. Hayward, formerly works manager at the Ruabon factory, has been named assistant to the managing director, Philip A. Singleton. Dr. Hayward's appointment is preliminary to assuming, in association with the Monsanto Chemical Co. of St. Louis, Mo., world-wide responsibilities as technical liaison officer for Monsanto Chemicals Ltd., and Monsanto Chemicals (Australia) Ltd. Dr. Hayward, a New Zealander by birth, joined Monsanto in 1941 and became works manager in 1949. He will establish his headquarters in St. Louis in September, 1955, after visiting Australia and New Zealand. E. V. Weeks, formerly area manager at the Ruabon factory, has been appointed works manager succeeding Dr. Hayward. Mr. Weeks joined Monsanto in 1937 as research chemist and became area manager in 1948.

May Acquire New Plant Site

Marbon Chemical Division of the Borg-Warner Corp. plans to acquire an option on a 300-acre plant site at Washington, West Va., Robert Shattuck, president and general manager of the division, announced recently. Acquisition of this property will permit the extension of Marbon's manufacturing operations, which now are conducted in plants located at Gary, Ind. Marbon's principal products are materials used in the rubber and paint industries. There are no plans for the immediate construction of a plant on the Washington site, Mr. Shattuck said. Marbon Chemical currently employs 150 persons in Gary. There are no present plans for curtailment of the Gary operations.

INTRODUCING

POLYSAR KRYNAC 801

The new Polysar, Cold, High Oil Resistant Nitrile Rubber.

LOOK TO MUEHLSTEIN

For POLYSAR KRYNAC 801

High Oil Resistant—Krynac 801 is a new acrylonitrile, butadiene rubber, designed for applications where maximum oil resistance is required.

Physical Properties—Krynac 801 is a product of the "cold" polymerization system, offering excellent physical properties, including exceptionally low compression set.

Processing—Krynac 801 is an easy processing polymer having low mill shrinkage, low compound Mooney, low die swell, and high extrusion rate.

Where medium oil resistance is required *look to* Krynac. For High oil resistance *look to* Krynac 801.

Complete technical service and laboratory facilities are yours for the asking. Call us for your copy of our new Polysar Krynac 801 bulletin.

MUEHLSTEIN is the exclusive agent in the United States for: POLYMER CORPORATION, LTD. OF SARNIA, ONTARIO, CANADA.

H. MUEHLSTEIN & CO. INC.

60 EAST 42nd STREET, NEW YORK 17, N. Y.

CRUDE RUBBER · SYNTHETIC RUBBER · SCRAP RUBBER · HARD RUBBER DUST · PLASTIC SCRAP

REGIONAL OFFICES: Akron · Chicago · Boston · Los Angeles · London · Toronto
WAREHOUSES: Akron · Chicago · Boston · Los Angeles · Jersey City

OBITUARIES

Ernest W. Davis

Ernest W. Davis, director of electrical engineering at the Simplex Wire & Cable Co., Cambridge, Mass., died on January 11 of a heart attack. He was 64 years old. Born in Auburn, Me., Mr. Davis was graduated from Massachusetts Institute of Technology in 1913. He joined the Simplex Engineering Department as an assistant electrical engineer two weeks before he graduated. In 1932, he was promoted to chief electrical engineer and in 1947 he was named chief engineer. Mr. Davis made many technical contributions to the development and design of cables and was particularly active in the American Institute of Electrical Engineers, having served as a vice-president and director, as well as a member of the board of examiners. At the time of his death, he was a fellow of the A. I. E. E. and president of the Insulated Power Cable Engineers Association. Mr. Davis was a member of the International Society of Municipal Electricians, International Electrical Inspectors Association, American Standards Association, Institution of Electrical Engineers of Great Britain, and other organizations. He was also active in community and social affairs. Surviving are his wife and son.

George P. Loomis

George P. Loomis, manager of tire compounding in the Tire and Equipment Division of the B. F. Goodrich Co., died on February 15 after a long illness. He was 60 years old. Mr. Loomis had been with Goodrich for 30 years. Born in Chicopee Falls, Mass., he was graduated from Harvard College in 1916 with a B. A. in chemistry. He joined Goodrich as a chemist in 1918 and left the company in 1921. Rehired in 1928, Mr. Loomis was a development engineer in the Boot and Shoe Department. He transferred to the Hood Rubber Co., a Goodrich subsidiary, in 1930, as technical head of footwear. In 1932, Mr. Loomis was transferred to the Tire Division in Akron as a compounder and became manager of tire compounding in 1939. Surviving are his wife, a son and a daughter.

Arthur L. Weyand

Arthur L. Weyand, former manager of Plant 2 of the Firestone Tire & Rubber Co., died of a heart attack in his home in Cuyahoga Falls, Ohio, on February 16. He was 71 years old. Mr. Weyand had been with Firestone for 40 years before retiring in 1951. He joined the firm in 1929 and became manager of Plant 2 in 1939. Mr. Weyand was born in Buffalo, N. Y. He was a member of St. Joseph Church, the Firestone 20-year Club, Akron Liedertafel, and other social groups. He is survived by his wife, two daughters and a son.

John Westendorf

John Westendorf, president of the Premier Rubber Manufacturing Co., Dayton, Ohio, and secretary-treasurer of the Dayton Casting Co., died on January 4 after suffering a cerebral hemorrhage. He was 78 years old. Mr. Westendorf was a director of the Third National Bank, the Home Savings and Loan Association and the Dayton Automobile Club. At one time, he was treasurer of the Home Savings and Loan Association. Born in Dayton, Mr. Westendorf attended Holy Trinity School. With his brothers, Joseph and Clarence, he organized the Dayton Casting Co. in 1909. In 1922, he and his brother Joseph purchased the controlling interest in Premier Rubber. Mr. Westendorf also served as vice-chairman of the Dayton Metropolitan Housing Authority from its establishment in 1934 until 1939, and was a past-president of the Dayton Bicycle Club and a member of the Knights of Columbus, the Eagles, the Elks and the Chamber of Commerce, as well as an active Catholic lay leader. He is survived by his wife.

Paul R. McCampbell

Paul R. McCampbell, vice-president and director of the I. B. Kleinert Rubber Co., in charge of the College Point, N. Y., factory, died on February 2 in his home in Great Neck, N. Y. He was 58 years old. Born in Crawfordsville, Ind., Mr. McCampbell was graduated from Wabash College. During World War I, he served as a captain in the Army in France and won several citations. After the war, he was associated with the U. S. Rubber Co. and the Hunter Dry Kiln Co. before joining Kleinert as an assistant chemist 30 years ago. Mr. McCampbell was named a director in 1941 and a vice-president in 1947. He was active in civic affairs in Great Neck. Surviving are his wife and son.

Gordon A. McLean

Gordon A. McLean, well-known in the rubber industry as an authority on Banbury mixers, died on January 28 in Fort Lauderdale, Fla., where he had been convalescing. He was 47 years old. A native of Canada, Mr. McLean was a naturalized U. S. citizen. In 1933, he organized the Interstate Welding Service in Chicago, Ill., to specialize in the repair and rebuilding of Banburys. In 1939, the business was moved to Akron, Ohio, and in 1954 became part of the Skinner Engine Co. of Erie, Penna. Mr. McLean is survived by his wife.

Another copy of RUBBER AGE needed in your office? Use the coupon on page 961.

Frank J. Feely

Frank J. Feely, who retired as engineer of manufacture for the Western Electric Co. in 1952, died on February 22 of a coronary thrombosis. He was 63 years old. Mr. Feely had been with Western Electric, in an engineering capacity, for 40 years at the time of his retirement. During World War II, he was in charge of the company's wartime manufacturing operations, serving as manager of specialty products from 1942 to 1945. In the latter year he became manager of the electronics shop and in 1946 had charge also of the company's station in Buffalo, N. Y. Born in Chicago, Ill., Mr. Feely received his mechanical engineering degree in 1911 from the Lewis Institute. He joined Western Electric at its Chicago works and in 1922 was made chief engineer of the Manufacturing Methods Division. In 1926, he went to the company's Kearny, N. J., works where he rose to superintendent of factory planning. He was promoted to the New York City headquarters as superintendent of factory extension in 1929. In 1947, he was named engineer of manufacture. the position he held at the time of his retirement. Surviving are his wife, a son and a daughter.

Henry Hardenbergh

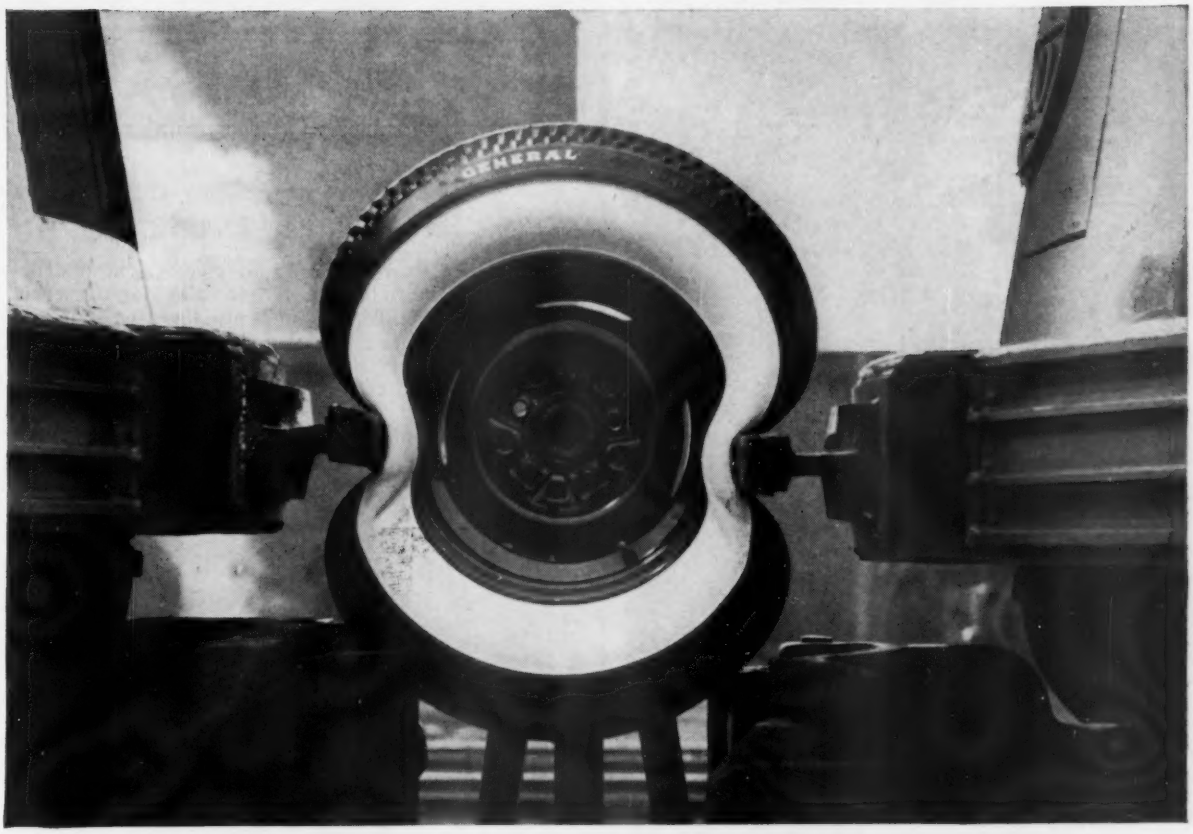
Henry Hardenbergh, chairman of the board of directors of the New Jersey Zinc Co., died on February 9. He was 72 years old. Mr. Hardenbergh was born in North Adams, Mass., and after graduation from Harvard University in 1904, joined New Jersey Zinc in 1905 as a chemist. Advancing through the organization, he was elected president and director in 1943 and chairman of the board in 1951. Mr. Hardenbergh was a member of the Harvard Club, the University Club, A. I. M. E., the American Mining Congress, American Zinc Institute and other organizations. Surviving are two daughters.

George Lashells Bubb

George Lashells Bubb, former director and treasurer of the Columbian Carbon Co., died on February 18 after an illness of several months. He was 75 years old. Mr. Bubb, who was born in Williamsport, Penna., was graduated from Princeton University with a B. S. degree in 1903. He was one of the founders of Columbian Carbon and retired as an official in 1950. Mr. Bubb had also served as president and a director of the Otto Chemical Co. and the Sergeant Gas Co. He is survived by his brother.

G. O. Gondree

G. O. Gondree, general manager and secretary of the Struthers Wells Corp. plant in Titusville, Penna., died at his desk on February 18. He was 69 years old. Mr. Gondree was a director of the Titusville Hospital, the Colonel Drake Hotel and Fisher & Young, builders' supplies. He was vice-president of the Chamber of Commerce and past master of the Titusville Masonic Lodge. Surviving are his wife, a daughter and son.



CIRCOSOL-2XH GIVES YOUR TIRES EXTRA TOUGHNESS

Make the rubber tougher and more resilient, and your tires will invariably stand up better under even the worst punishment. Circosol-2XH helps you do just this . . . and without getting your material costs out of line.

Tires made with Circosol-2XH have greater resistance to abrasion, and can take sharper impacts and more all around abuse than tires made with ordinary softeners. Circosol-2XH helps inhibit the spread of cuts, and helps tires endure hard summer driving on hot roads without developing damaging heat build-up.

The cost of this added protection is surprisingly low. For example, enough Circosol-2XH for an 8.00 x 15 size 100 level tire costs less than 2¢ more than the cheapest softener you can buy. Cheap insurance, to say the least.

You can get the full story on the advantages of Circosol-2XH from your local Sun Oil Company Representative. Or write Dept. RA-3.

INDUSTRIAL PRODUCTS DEPARTMENT
SUN OIL COMPANY

SUNOCO®

PHILADELPHIA 3, PA. • SUN OIL COMPANY LTD., TORONTO & MONTREAL

Refiners of famous High-Test Blue Sunoco Gasoline

THE CARTER BELL MFG. CO.
SINCE
CARTER BELL PRODUCTS
1903
SPRINGFIELD, NEW JERSEY

Vulcanized
VEGETABLE OILS

rubber substitutes

Types, grades and blends
for every purpose, wherever
Vulcanized Vegetable Oils
can be used in production
of Rubber Goods—
be they Synthetic, Natural,
or Reclaimed.

A long established and proven product

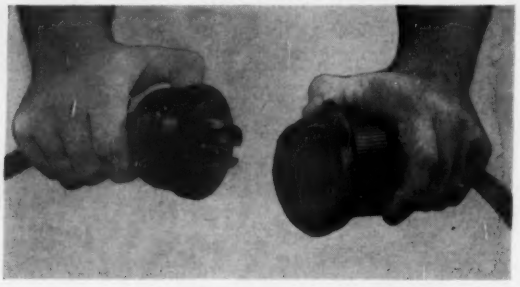
THE CARTER BELL MFG. CO.
SPRINGFIELD, NEW JERSEY

Represented by
HARWICK STANDARD CHEMICAL CO.
Akron, Boston, Trenton, Chicago, Denver, Los Angelos

NEW GOODS

Flip Seal Electrical Connectors

After more than two years of research, design, development and production, the Rodale Manufacturing Co., Emmaus, Penna., has now introduced what is said to be an entirely new principle in UL-approved electrical connectors. Patents have been applied for on this new series of connectors which are being distributed under the trade name of "Flip Seal". Basically, the unit will serve the same purpose as any present connectors, but the design offers protection never before possible, the company states. A flexible rubber lip has been incor-



porated over the female component of the connector which flips over the male component to insure a positive sealing and locking type action. At both ends of the connector, the cable entrances are also provided with a sealing action wherein the cable entrances fit snugly around the wire. These actions seal out moisture, dirt, dust, metal particles, and other conditions which tend to interrupt the flow of current. The connector components themselves are molded of phenolic and completely encased in a rubber or neoprene housing. At present, ten different connectors in the Flip Seal line are available in either the rubber version or the neoprene variety.

Plastic Window Track

A self-lubricating plastic track that makes possible a combination storm-screen window, which can be opened or closed easily no matter what the weather, has been developed by the Robert S. Crane Associates, Columbus, Ohio. The tracks are made from Kralastic, a tough, corrosion-resistant blend of rubber and plastic produced by the Naugatuck Chemical Division, U. S. Rubber Co. It is formed into rigid, smooth-surfaced, triple-grooved track sections that fit into the window's metal frame. The window units slide up and down on these tracks without sticking or binding. The tracks are also flexible enough to give with any expansion in the metal of the window. Several thousand windows with the new tracks have already been installed. In the windows, track sections are fastened to the upper half of the frame, just snapped in place in the lower half. This allows the housewife to remove the lower track sections so that storm sash can be taken out for cleaning. Weather-Seal Inc., Barberton, Ohio, the manufacturer of the window, reports good performance and acceptance.

Rubber-Modified Styrene Sheet

A new type rubber-modified styrene sheet said to be of improved impact strength, fine texture, and exceptional freedom from strains is now being offered in a wide range of thicknesses and colors by the Campco Division of the Chicago Molded Products Corp., Chicago, Ill. Called "Campco S-540," this new sheet, according to the manufacturer, provides at least twice the impact strength of Campco's well known S-300, at no increase in cost. In the thinner gauges, from .010-inch to .030-inch, Campco S-540 is available with either mat or polished surface. Because of the closely controlled extrusion process, reducing internal strains to a minimum, this sheet is especially suitable for printed jobs, where close register is required. The material is also recommended for displays, packaging, toys, and other applications where high physical characteristics are required in the thin sheet. The thinner gauge sheets are supplied in widths up to 26 inches. In the heavier gauges, Campco S-540 is available in thicknesses from .040-inch to .187-inch. The heavy gauge material can be supplied in mat finish, polished finish, or in a high-gloss (GM) finish, with a luster comparable to that of porcelain enamel. The heavier sheets are available in widths up to 40 inches, and are recommended for equipment housings, refrigerator parts, racks, trays, and many similar applications.

Vinyl Playing Cards

Northbrook Plastic Card Co., Northbrook, Ill., is now producing playing cards made from Geon rigid high impact vinyl. It is claimed that these cards will outwear up to 100 decks of ordinary cards. The cards, made from sheeting supplied by Nixon Nitration Works, Nixon, N. J., keep their "snappiness" through many games, it is said. When the cards become soiled they

can be easily cleaned by washing them with a clean cloth moistened with cold water and then wiping dry, one card at a time, with a clean towel. Soap can be used to get out stubborn stains. The vinyl cards resist the effects of alcohol or other fluids with which they might come in contact. The new Northbrook vinyl playing cards are designated as "Windsor Medallion", and come in both blue and red colors.

Originators Liner

Capitol Process

PROCESSORS

of

NYLON - RAYON

and

OTHER FABRICS

All Widths and Weights

with

RESORCINOL FORMALDEHYDE LATEX Compounds

also

CAPITOL LINER PROCESS

TEXTILE PROOFERS INC.

Jersey City 5, N. J.

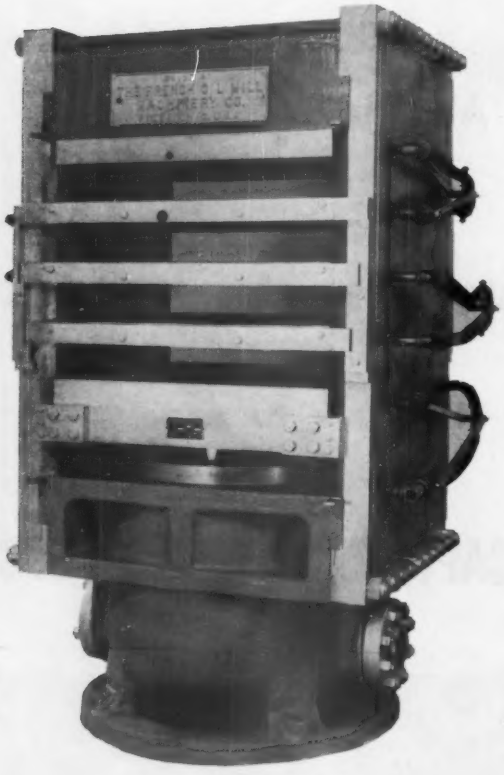
"A QUARTER OF A CENTURY EXPERIENCE"

FRENCH
SIDE PLATE
CURING PRESS

Low Maintenance — No difficult adjustments to make, no nuts to tighten.

Long Mold Life — Improves close tolerance molding and gives longer mold life.

Permanent Rigidity — Exclusive, patented construction assures permanent rigidity and alignment.

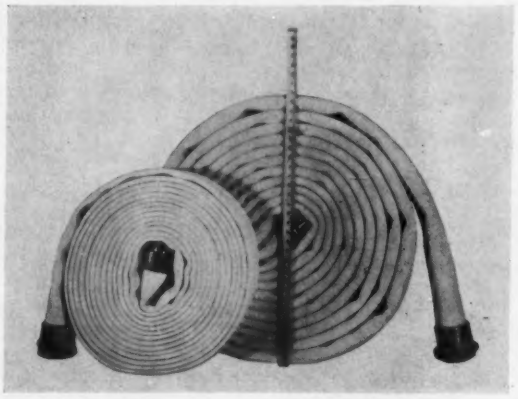


Complete line of Standard Sizes.
Write for Free Illustrated Catalog.

THE FRENCH OIL MILL MACHINERY CO.
(HYDRAULIC PRESS DIVISION)
1022 GREENE ST. PIQUA, OHIO

Hamilton Flexrite Fire Hose

Hamilton Rubber Manufacturing Corp., Trenton, N. J., has announced the addition of "Flexrite Fire House" to its line of industrial rubber products. Flexrite hose employs Dacron as filler cords in both inner and outer jackets to give maximum strength. These filler cords enable the company to offer a lighter, more flexible fire



hose, officials state. Flexrite is supplied in 1½-inch I. D. and 2½-inch I. D. double-jacketed construction with 400 pounds of test pressure. One of the advantages of Flexrite, compared to conventional cotton types of fire hose, is its ability to rack and handle easier in actual use. It also saves space because it folds tighter, Hamilton Rubber states.

Underground Water Service Hose

A new yellow covered water hose, designed primarily for underground water service, has been announced by Boston Woven Hose & Rubber Co. of Cambridge, Mass. According to the company, the new "Golden VIM" water hose is made with a bright yellow cover to make the hose more visible during underground water service. The new hose, according to the company, helps eliminate the

hazard to the workmen, as well as accidental damage to the hose itself. The tube is specially compounded for resistance to water absorption while the cover is designed to withstand severe service conditions. The company states that although Golden VIM is especially constructed for mining service, the high quality cover, flexibility, and strength it possesses makes the product a natural for many other applications. The new product is offered in ¾-inch I.D. and 1-inch I.D. sizes.

Neo-Sponge Comfort Mat

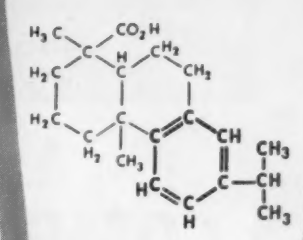
American Floor Products Co., 4922 Wisconsin Avenue, N.W., Washington 16, D. C., is now offering a new industrial and commercial floor matting designed to reduce employee fatigue and injury. The product is called "Neo-Sponge Comfort Mat", and is made through a special patented process of blowing millions of inert nitrogen bubbles into neoprene. The new mats are said to offer permanent resilience, high electrical resistance (61,000 volts before puncture), and an almost

impervious resistance to acid, oil, grease and heat. The company states that the mat will outwear any similar product made of rubber and, unlike rubber, will not absorb any liquid or vapor. The mat is said to be especially suited to any type of business where employees stand at their jobs. The molded tread design on both sides makes it reversible and offers excellent non-slip foot traction. The mat is available in two thicknesses, ¼ and ⅜- inch, and in standard sizes up to 36 inches wide and 10 feet long. Larger sizes can be supplied on request.

Neoprene Inking Roller

A new letterpress inking roller made of neoprene has been introduced by the Roller Corporation of America, 611 South Avenue, Garwood, N. J. The roller is made by a new process in which neoprene is molded directly to the core under 100,000 to 250,000 pounds hydraulic pressure. The company states that its patented process permits use of a softer compound than the conventional method of wrapping sheet rubber around the core. High pressure molding is also said to eliminate the possibility of ply separation and to produce a tough, dense structure. Sinclair & Valentine Co., leading ink manufacturers of New York, N. Y., have tested the new rollers and have reported excellent results. It is stated that the rollers do not change in circumference with changes in temperature or humidity. Also, like any rubber roller, the new neoprene rollers are heat vulcanized. They heat up on a high speed press, but they do not soften. Rollers made of neoprene are also more resistant to oils and solvents than ordinary rubber. The new rollers are made in all sizes up to Miehle 2/0 with 55½-inch face.

GALEX®



STRUCTURE

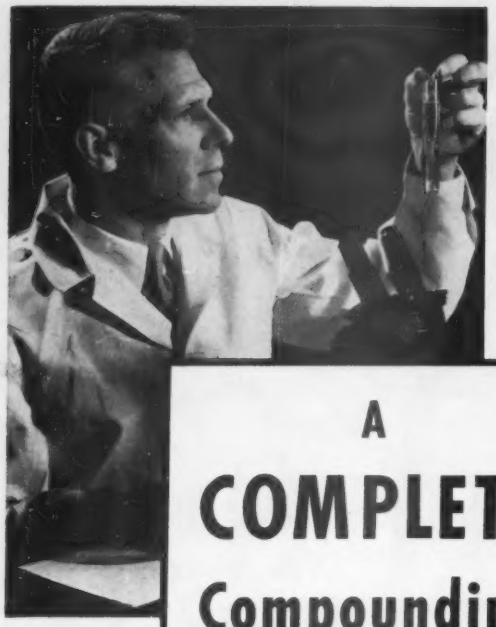
A non-oxidizing tackifier and plasticizer for GR-S, NEOPRENE, NATURAL RUBBER and RECLAIM.

"Galex" is a stable rosin acid that effectively tackifies and plasticizes GR-S, Neoprene, natural rubber and reclaim. Because of its chemical structure, principally dehydroabietic acid, "Galex" is unaffected by oxidative aging and does not induce oxidation of elastomers in which it is used. It is highly compatible with various elastomers, resins and solvents.

"Galex" is widely used as a tackifier-plasticizer in hose, belting, mechanical goods and various friction stocks. It imparts strong surface tack which develops into excellent adhesion after cure. "Galex" also functions as a highly stable and compatible tackifier in rubber-base adhesives and cements.

Write for technical information and samples.

Thiokol Chemical Corporation
SYNTHETIC RUBBERS • PLASTICIZERS • CHEMICALS • SOLID PROPELLANTS
784 NORTH CLINTON AVE., TRENTON 7, NEW JERSEY
In Canada: Naugatuck Chemicals Division, Dominion Rubber Company, Elmira, Ontario



A
COMPLETE
Compounding
Service
FOR
EMULSIONS • SOLUTIONS
and HOT MELTS . . .

YES, ARCCO offers you a complete compounding service. While offering you a wide range of completed formulations, ARCCO will be glad to develop and compound special formulas to meet your individual needs. All compounds are designed to meet rigid customer specifications based on specified tests in the ARCCO Laboratories.

If you wish greater water, heat or abrasion resistance in air drying or curing formulations, you need only to call for ARCCO Technical Service. Our present available formulations include such specialties as heat seal coatings, plastisols, organosols and laminants for vinyl films.

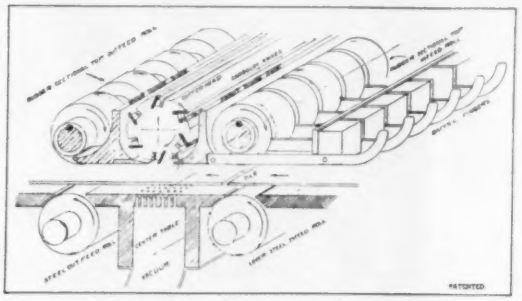
Whether your business is Textile, Rubber, Leather, Paper, Plastics, Automotive or Chemical, ask for an ARCCO engineer. He will be happy to work with you.

ARCCO
AMERICAN RESINOUS
CHEMICALS CORPORATION
RESIN EMULSIONS, SOLUTIONS AND HOT MELTS FOR ADHESIVE BASES, BINDERS, COATINGS, SIZES AND SATURANTS
GENERAL OFFICES: 103 FOSTER STREET, PEABODY, MASSACHUSETTS
IN CANADA: American Resinous Chemicals of Canada, Ltd., Toronto, Canada

NEW EQUIPMENT

Improved Micro-Surfacing Machine

Some time ago a new machine for the precision surfacing or planing of molded rubber and plastic products to required thickness was described in these columns (RUBBER AGE, November, 1953). Called the Micro-Surfacer, the machine is made by the Buss Machine Works, of Holland, Michigan, and is an adaptation of one of the company's single surface wood planers. Since the original unit was developed the company has added many improvements, most of which were emphasized in a recent demonstration at the company's plant. The



first installation of this unique machine was made in 1951, and many additional installations have been made since.

Designed for high production planing of very thin flexible materials, the Buss Micro-Surfacer has a number of advantages, including the following: Sizes to tolerances of .001; equipped with Carboloy knives for long production runs between grinds; knives can be ground in the machine with built-in grinding equipment; eliminates dust and grit on stock while removed material is clean and salvageable; provides excellent gluing surface; high-speed head can easily plane oversize stock; equipped with variable feed; available in widths up to 50 inches; adjustments are graduated in thousandths.

Operation of the unit can be followed in the accompanying cross-sectional sketch. Stock is transferred in and out of the unit by built-in power-driven conveyors. The cutter head is equipped with six Carboloy knives and is rotated at 4500 rpm in the direction of the feed. Stock is fed past the rotating cutter head by means of two rolls located before the cutter head and two behind. The two lower rolls are steel, hard chrome-plated and ground to a mirror finish, while the two upper rolls are rubber sectional. Guide shoes, which do not touch the stock, are located on both sides of the cutter head and are set above the material being planed. These guiders are equipped with "fingers" to prevent the stock from stopping in the machine. They also direct the flow of shavings up the exhaust hood. Thin flexible material is held down rigidly during the sizing operation by means of a patented ground and lapped vacuum work table and vacuum pump system which is regulated by pressure relief valves. Feed rate of the machine can be changed infinitely by the variable feed drive.

Micro-Surfacers are now installed in several floor tile plants and are running in constant production over

DO YOU MAKE...

Industrial Rubber Parts?
Insulated Wire?
Shoe Soles?
Tile?

Buy your Neoprene Grade magnesia from a SPECIALIST!

General Magnesite

will serve you with the widest range of quality magnesias:

GENMAG TECHNICAL EXTRA LIGHT CALCINED MAGNESIA	for excellent scorch resistance, high tensile and fast cures.
GENMAG ML TECHNICAL LIGHT 101	Two good low-cost magnesia values
HEAVY CALCINED MAGNESITE—	for Filler, Corrective and Extender
CARBONATE OF MAGNESIA, LIGHT—	fine and pure

GENERAL MAGNESITE AND MAGNESIA COMPANY

Manufactured at: Plymouth Meeting, Penn., *Phone:* Plymouth Meeting 3-2880, *Mailing Address:* Box 671, Norristown, Penn.

Thomaston TEXTILES *for the* **RUBBER INDUSTRY**

specifically engineered to meet your needs

TIRE FABRICS
HOSE AND BELT DUCKS
CHAFERS
YARNS • THREADS • CORDAGE
SHEETINGS • COATING
FABRICS • DIVERSIFIED
COTTON FABRICS

DEPENDABLE THOMASTON Fabrics SINCE 1900

We invite your inquiries

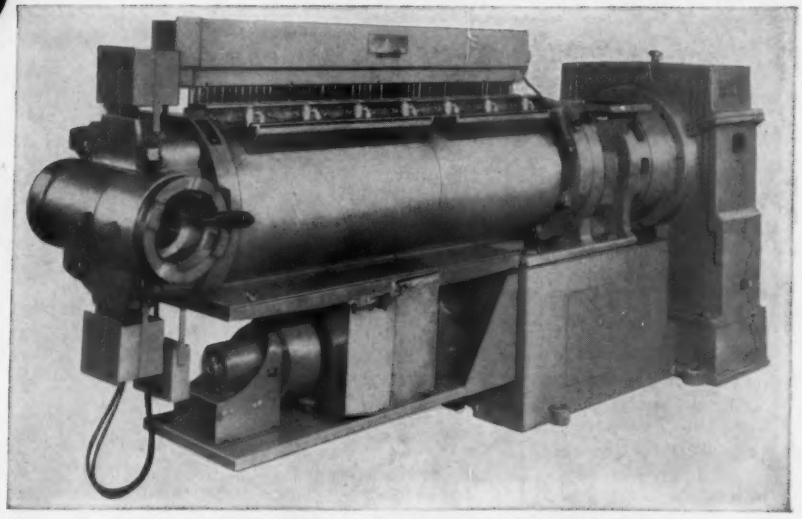
Thomaston Mills

THOMASTON, GEORGIA • NEW YORK OFFICE: 40 WORTH STREET
AKRON, OHIO OFFICE, 308 AKRON SAVINGS AND LOAN BUILDING

THE ROYLE ALL • ELECTRIC SPIROD

The latest addition to the Royle line, these all-electric Spirod extruders are built to supply — and hold — the higher and accurately zoned operating temperatures that are essential to present extrusion processes. This outstanding performance is only possible with the inclusion of a proportioning controlled system of high velocity evaporative cooling combined with tubular resistance heating — just one of the many features that assure economical, dependable production.

Available in standard sizes 1⅛" through 12"



No. 5 8½" ROYLE SPIROD EXTRUDER

JOHN ROYLE & SONS

ROYLE PATERSON N. J. 1880

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

London, England	Home Office	Akron, Ohio	Los Angeles, Cal.
James Day (Machinery) Ltd.	V. M. Hovey J. W. VanRiper	J. C. Clinefelter	H. M. Royal, Inc.
Hyde Park 2430 - 0456	SHerwood 2-8262	SWandale 4-5020	LOgan 3261

PATERSON 3, NEW JERSEY

safely, economically, without dust!

Regardless of the problem, DuBois has eliminated troublesome sticking in *all* rubber manufacturing operations...cleanly...economically...dependably...with no interference to subsequent operations.

To Eliminate Dust
Latex-Lube Pigmented
Latex-Lube R-66
Liqui-Lube

For Batch-Off Machines
Liqui-Lube NF
Latex-Lube R-66
Latex-Lube Pigmented

Where Foaming Is A Problem
Liqui-Lube NF
Latex-Lube Pigmented

As An Additive For Improved Mold Release
Latex-Lube GR

On Very Pale Stocks
Liqui-Lube NT
Liqui-Lube GCB

As An Extrusion Bath
Liqui-Lube

Liqui-Lube GCB
Liqui-Lube NT

As A Final Surface Lubricant
Latex-Lube GR
Liqui-Lube

For Pelletizing
Latex-Lube Pigmented

Dept. K

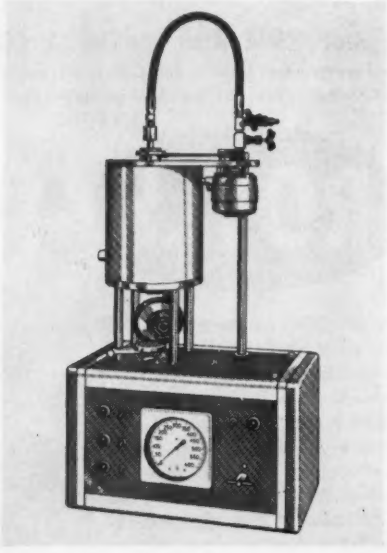
Got a *special* problem?
We make special compounds for your particular needs.

The DuBOIS Co., Inc.
Cincinnati 3, Ohio Los Angeles 33, Calif.
Representatives and Warehouses from Coast to Coast

45,000 square feet of rubber and vinyl floor tile before it becomes necessary to shut down the machine to sharpen the Carboloy knives. In the case of shoe soling materials, the clean cutting action of the rotating cutters provides a gluing surface which is said to be far superior to a sanded or split surface as the cutting action microscopically opens the pores of the stock and there is no grit or dust to interfere with the bond between the glue and the shoe soles. On brake linings, the machine is reported to provide more than a 1000-to-1 better performance. Successful tests have also been run on cork gaskets and plastic sheets.

Castor-Severs Extrusion Rheometer

A new line of rheometers for the measurement of viscosity at high rates of flow in control, formulation, research and production processes is now being offered by the Burrell Corp., 2223 Fifth Ave., Pittsburgh 19, Penna. Known as the Castor-Severs Extrusion Rheometers, they are complete unit-package instruments delivered ready for use as reliable tools for the accurate measurement of viscosity of coatings, adhesives, pastes and plastisols in various fields where thickness of material is a factor. Seven models operate over a wide range of temperatures from room temperature to 300°C., and at pressures from atmospheric to 3000 p.s.i. Special attachments permit operation at temperatures as low as —40°C. and pressures up to 5000 p.s.i. Reproducible accuracy is obtained from 1 centipoise to over 5 billion centipoises. Operation is simple in method and practice. Air pressure is applied to a material chamber. Samples being tested are timed and measured as they are extruded through a calibrated orifice. The units are easy to set up, easy to operate and can be dismantled and cleaned quickly. Increased productivity per man hour in the laboratory, acceleration of processes and improved maintenance of reproducible standards in plant operation are said to be some of the values to users inherent in the equipment.



It's Progressive...

FOR FINER
CUTTING DIES of all kinds
MALLET DIES
CLICKER DIES
PERFORATING DIES
I. D. and O. D. DIES
PUNCH PRESS
TRIMMING DIES
PUNCH PRESS
PINCHING DIES
RENCO CUTTING PADS
and BLOCKS

Also Manufacturers of
Precision Automatic
Screw Machine Products,
Inserts, etc.

Makers of Western RMH Cutting Dies.

PROGRESSIVE SERVICE COMPANY

Main Office and Factory
2747 Locust St.
ST. LOUIS, MO.
Tel.: NEWSTEAD 4300

Branch Office and Factory
82 S. Cameron St.
HARRISBURG, PA.
Tel.: 2-8146

25th Anniversary RC

RC COMONOMERS

RUBBER CORPORATION OF AMERICA

FUMARATES
MALEATES

The following unsaturated diesters of high purity are now available in commercial quantities for use as comonomers in polymerization reactions:

- **DIOF** Di-iso-octyl Fumarate
- **DOF** Di-2-ethyl hexyl Fumarate
- **DBF** Dibutyl Fumarate
- **DIOM** Di-iso-octyl Maleate
- **DOM** Di-2-ethyl hexyl Maleate
- **DBM** Dibutyl Maleate

Write today for samples and brochure on RC products.

RUBBER CORPORATION OF AMERICA
New South Road, Hicksville, N.Y.

Sales Offices:
New York, Akron, Chicago, Boston

new LIGHTWEIGHT TOTE BOX

CONSTANT TARE NO MAINTENANCE

This rubber shop has no problem weight-counting parts. They've switched to new Toteline Tote Boxes that require no maintenance—and so, the tare is constant, within two ounces.

And, these fiberglass-reinforced plastic tote boxes are lightweight, too . . . in fact, they weigh ⅓ as much as the boxes you may now be using. But, lightweight though they are, they are *strong*—in fact, it is almost impossible to wear them out!

LOOK! THEY NEST, TOO!

Write for complete details

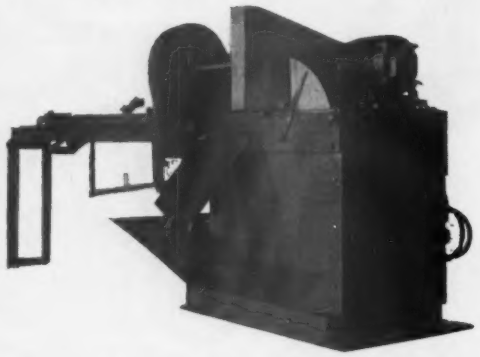
TOTELINE

MOLDED FIBERGLASS TRAY COMPANY

World's largest producers of Fiberglass-reinforced resin trays and tote boxes

LINESVILLE, PENNSYLVANIA IN CANADA: NEWAGE (CANADA) LTD., TORONTO 14, ONT.

SLICER MACHINE
for
EXTRUDED STOCKS



Capacity Section up to 4" OD or 4x6" flat stock.
Length 3/16" to 8".
Cuts per minute 25 to 175.
Automatic Feed and Circulating Pump.
Made in three sizes.

UTILITY MANUFACTURING COMPANY
Cudahy, Wisconsin
Write Today for Complete Information

Decorate and Identify

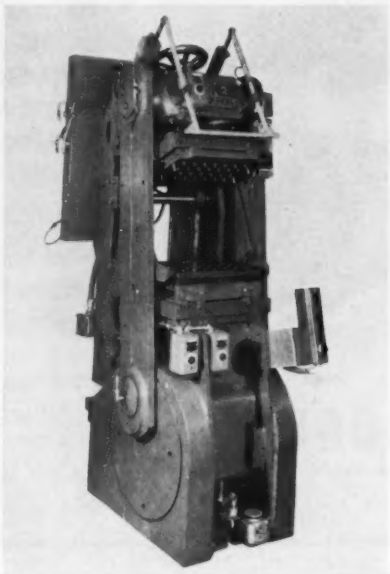
Your Rubber or Vinyl Products with
MEYERCORD
ELASTICALS

for trade marks, instructions
or high color rubber or vinyl
product decorations, write to

ELASTICAL DIVISION
THE MEYERCORD CO.
World's Largest Decalcomania Manufacturers
DEPT. D-423, 5323 WEST LAKE STREET, CHICAGO 44, ILLINOIS

Bantam Transfer Molding Press

A new, compact, low cost, high production mechanical rubber goods transfer molding press, reported to provide new latitude to mold design, has been introduced by the McNeil Machine & Engineering Co., 96 East Crosier St., Akron 11, Ohio. Called the McNeil-Akron Bantam, the new unit is of 10 by 16 inch mold size. Designed



especially for rapid, economical production of small, close-tolerance products, it handles two-, three- and four-plate molds automatically. This is in keeping with the present trend toward the use of smaller molds in greater number. The Bantam press requires only eight square feet of floor space. Its over-all measurements of 26½ inches by 44 inches by 5 feet, 10 inches closed or 6 feet, 10 inches open make it suitable for use in crowded press rooms. According to the manufacturers, the automatic operation of the Bantam eliminates hand work completely and reduces mold maintenance costs substantially.

Schrader Tubeless Tire Tools

Two new tools which make it comparatively simple to service cars with snap-in type rubber-covered valves or other cars when conversions are made from conventional to tubeless tires have been introduced by A. Schrader's Son Division of Scovill Manufacturing Co., 470 Vanderbilt Ave., Brooklyn 38, N. Y. One of these tools, the Schrader No. 505 Pull Type Lever Tool, is said to quickly, easily and safely seat snap-in valves in round rim holes on any model car and any rim size. The knurled fitting of the tool attaches to the cap threads of the valve and slight lever pressure pulls the valve into the required air-tight seating position. The other unit, the Schrader No. 552 Pull Type Mounting Tool, straddles the valve and seats it in the rim hole when the wing-nut is turned down. The tool screws onto the valve cap threads and safely seats the valve against the inside of the rim. Both tools can also be used to remove worn or damaged snap-in valves.

Atlas Laboratory-Production Press

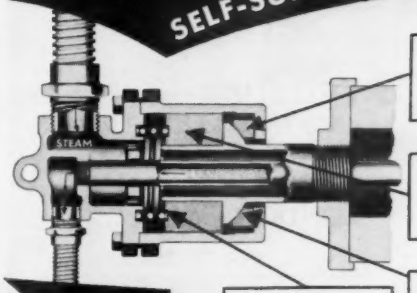
Designed for both laboratory and production use, a new hydraulic press for the precision molding of rubber and plastics has been introduced by Atlas Hydraulics, Inc., 3576 Ruth St., Philadelphia 34, Penna. Called the Atlas Model 60-12, the new unit is produced with a choice of electrically-heated 12 by 12 inch or 14 by 14

inch platens. Each press is equipped with individual controls to regulate hydraulic pressure for each operation within a range of 50 to 4000 psi, the hydraulic pressure aggregating 60 ton capacity. Accurate and consistent pressure is maintained on the platen area at all times by means of a newly-designed air-operated boost pump. A new cooling system reduces platen transfer heat on the ram, ram pot, hydraulic oil, and packing. This system is said to prevent acceleration of chemical changes in the oil, maintain the viscosity and acidity of the oil, and prevent deposition of gums and varnishes on highly polished surfaces. A newly designed ram is said to reduce packing changes to mere minutes. The ram has also been chrome plated to insure a perfect seal with the packing.

A low-cost **remote indicating temperature controller,** said to be accurate within one per cent of full scale under most conditions, has been introduced by Fenwal, Inc., of Ashland, Mass. Designed for economical operation in ovens, packaging and processing equipment of all types, the new controller, called the Series 540, has a temperature operating range of 100° to 700°F. with uniform sensitivity throughout the range.

A major scientific advance in accelerated corrosion testing of finishes and coatings is claimed for the **H-T Sincolite Test Cabinet,** a product of the G. S. Equipment Co., 5317 St. Clair Ave., Cleveland 3, Ohio. Picture-window visibility is made possible by the insulating effect of flat panel water-packets housing two electric heaters located front and rear on the outside of the cabinet. More uniform temperature is also claimed for the new testing unit.

JOHNSON Rotary Pressure JOINT
SELF-SUPPORTING TYPE



1. SEAL RING — of special carbon-graphite. Eliminates packing and oiling.
2. GUIDE — Also of carbon-graphite. Makes joint self-supporting.
3. NIPPLE — Rotates with roll, seals against ring.
4. SPRING — For initial seating only. In operation joint is pressure sealed.

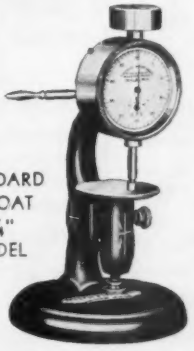
Only 4 Internal Parts

For introducing steam and liquids into rotating rolls and cylinders, there's nothing like the Johnson Joint above. It's packless, self-lubricating, self-adjusting, self-supporting. It has been adopted by dozens of machinery makers, and is finding new uses every day.

Type SB shown handles both steam and condensate through same head; also available for through flow service, and in sizes and styles for all operating conditions. *Write for literature.*

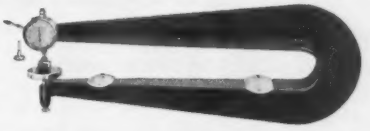
The Johnson Corporation
868 Wood St., Three Rivers, Mich.

RANDALL & STICKNEY
THICKNESS GAUGES FOR RUBBER



STANDARD THROAT 1¾" MODEL

THROAT DEPTHS 1¾" to 26"
FOOT TENSIONS supplied by Internal Spring or Direct Weights
FOOT DIAMETERS ⅛" to 1¼"
ROLLS Table and Roll or two Rolls
RANGE ½" or 1", also 1 CM Metric



26" DEEP THROAT MODEL

SEND FOR CIRCULARS to Dept. A.

FRANK E. RANDALL CO., Inc.
248 Ash St., Waltham 54, Mass., U.S.A.

Institution of the Rubber Industry

LONDON

The I.R.I., which was founded in 1921, is now a great association of people engaged in all branches of the Rubber Industry. Its members include rubber producers, manufacturers, scientists, technologists, executives, students and others, in many countries of the world.

It has reached its present position of authority and respect through the high standard it has set for the technical literature it publishes, the diplomas it awards, and the meetings and conferences it organizes.

In collaboration with other Societies, it aims to raise the standing of the Industry throughout the world by improving the technical qualifications of its personnel, extending the study of its raw materials, processes, and products, and by promoting the exchange of technical discovery and information by means of literature, conferences, and meetings.

Membership of the Institution is open to all interested at an annual subscription of $7.50 which entitles the member to receive the bi-monthly Transactions free of charge and to purchase other publications (such as the Annual Reports and Monographs) at reduced rates. It also serves to put him in touch with his colleagues and their work in other parts of the world and confers on him full rights to vote, to nomination for election to the Council and to participate in meetings and Conferences organized by the Institution.

Complete details are easily obtained by writing to:

Secretary,

INSTITUTION OF THE RUBBER INDUSTRY

12, WHITEHALL

LONDON, S.W. 1, ENGLAND

REVIEWS

BOOKS

The Technique and Practice of Costing for the Rubber Manufacturing Industry. Published by the Federation of British Rubber Manufacturers' Associations, 43 Bedford Square, London, W.C.1, England. 5½ x 8½ in. 60 pp. $1.50 (postpaid).

Although many rubber manufacturers on both sides of the Atlantic have established costing systems, or cost accounting systems as they are frequently called, there are a surprisingly large number of manufacturers who still use a hit-and-miss method. The latter method frequently results in overbidding or a net profit result somewhat on the disappointing side. Recognizing this situation, a subcommittee of the Accountants' Committee of the Federation of British Rubber Manufacturers' Associations was appointed to prepare a manual on costing methods, and this booklet is representative of their work. The booklet is divided into eight chapters, as follows: (1) Introduction; (2) Budgetary Control and Standard Costs; (3) Materials; (4) Labor; (5) Overhead Expenses; (6) Interlock of Cost and Financial Accounts; (7) Notes on the Application of Costing in the Rubber Industry; (8) Example. The latter chapter is based on the experience of an imaginary company in the rubber manufacturing field, and can readily serve as a guide to the uninitiated. The booklet is crammed full of facts and common sense, and should prove most useful to many rubber manufacturers.

•

Organic Reactions: Volume VIII. Edited by Roger Adams. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 6 x 9 in. 438 pp. $12.00.

As indicated, this is the eighth volume of a series which was started in 1942, the intention being to provide a compilation of all the important synthetic chemical reactions. Each chapter in the series, furnished by an outstanding authority, provides a comprehensive survey of a particular reaction and includes a general discussion of method, modifications, examples of applicability, expected yields, and other pertinent data. The current work contains eight chapters, as follows: (1) Catalytic Hydrogenation of Esters to Alcohols; (2) The Synthesis of Ketones from Acid Halides; (3) The Acylation of Ketones to Form Beta-Diketones or Beta-Keto Aldehydes; (4) The Sommelet Reaction; (5) The Synthesis of Aldehydes from Carboxylic Acids; (6) The Metalation Reaction with Organolithium Compounds; (7) Beta-Lactones; (8) The Reaction of Diazomethane and Its Derivatives with Aldehydes and Ketones. A subject index is included.

•

French-English Dictionary for Chemists. (Second Edition). By Austin M. Patterson. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 5¼ x 7 in. 476 pp. $6.50.

This work has served as a trusted reference for the past thirty years. The new edition, completely modernized and expanded, contains 42,000 terms as compared with 35,000 in the first edition. This dictionary provides comprehensive chemical coverage and in addition defines words from other fields that occur in chemical reading. The author has combed the most recent French books in chemistry, mechanics, industry, medicine, and related fields, and the results contribute to the increased coverage, despite the omission of terms that have the same spelling and meaning in French and English. One of the most practical features in the book is the appearance of irregular forms of words, especially verbs, under their own spelling. Any technologist concerned with French-English translations will find this new edition of definite value.

BOOKLETS, CATALOGS, etc.

A Method for Classifying Oils Used in Oil-Extended Rubbers. Industrial Products Department, Sun Oil Co., Philadelphia 3, Penna. 8½ x 11 in. 24 pp.

The data contained in this well-printed, two-color booklet are based on the results of a research program started by Sun Oil on the hydrocarbon composition of rubber processing aids and later conducted in cooperation with the Polymer Corporation, Ltd., and the General Tire & Rubber Co., most of which has previously been reported in the technical journals. After discussing the need for an efficient method for classifying oils used in oil-extended rubbers and the effect of oils on the low temperature characteristics of such rubbers, the booklet contains several sections on classification methods. These include classification by viscosity index, classification by composition, use of aniline point in classification, combined V.G.C. and viscosity classifications, hydrocarbon-type classification, and classification by reactive materials. A table giving examples of the classification system as applied to spot samples of rubber processing oils is included.

•

Foam Latex Production with the Oakes Continuous Automatic Mixer. (Bulletin No. 200). E. T. Oakes Corp., Islip, Long Island, New York. 8½ x 11 in. 32 pp.

Although containing a good deal of specific information on the development and manufacture of the Oakes Continuous Automatic Mixer as such, this booklet may also be regarded as a manual on the production of latex foam rubber sponge by the continuous method. It spells out in text and illustrations the technique of production, the treatment of raw materials, the equipment required, installation procedures, and operational methods. The illustrations alone should prove of extreme value to any manufacturer contemplating the production of latex foam or to any individual planning the construction of a factory for such production. These include not only a schematic layout for a foam rubber plant, but a foam latex operating chart as well. Each requirement discussed in the text is treated with an A-B-C approach which both the experienced and uninitiated will find of value. Although issued as commercial literature, this booklet is a welcome addition to the technical literature.

•

Application of BRC 22 Hydrocarbon versus Carbonex S Hydrocarbon in Natural Rubber and Synthetic Elastomers. (Rubber Laboratory Release No. 14). Barrett Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y. 8½ x 11 in. 24 pp.

Due to raw material shortages, Barrett was recently required to discontinue the manufacture of its well-known Carbonex hydrocarbons. BRC 22 represents the company's efforts to produce a similar reinforcing type softener for rubber compounds. As indicated by its title, this technical report is devoted to laboratory evaluations between the two materials. Data are given on processing, Mooney viscosity and scorch, rate of cure, tensile and hardness, abrasion resistance, tear resistance, flex resistance, compression set, impact resilience, and heat aging. Four basic compounds were used in the tests, covering natural rubber, GR-S, neoprene and nitrile rubber, respectively. The results indicate that the performance of BRC 22 Hydrocarbon is essentially similar to the Carbonex hydrocarbons in all compounds tested.

•

The SAE Story. Society of Automotive Engineers, 29 West 39th Street, New York 18, N. Y. 5½ x 8½ in. 56 pp.

This history of the Society of Automotive Engineers is published to commemorate the 50th anniversary of the organization. Beginning with an editorial in a 1902 issue of *Horseless Age*, which pointed out the need for a "Society of Automobile Engineers," the history traces the high spots of SAE's past from its start to its Golden Anniversary in 1955.

CAROLITE
COLOR CHIPS
for
LACQUERS

colors fully ground-in
the following
MEDIA

"VINYLITES" vagh-vylf-vyns-vyhh
"HALF SECOND BUTYRATE"
"SARAN"
"PLIOLITES" S-4, NR
"HY-CAR"
POLY VINYL BUTYRATE
ETHYL CELLULOSE
POLYSTYRENE
40 series } permanently flexible
70 series }

CENTURY
COLOR CHIPS ARE OUTSTANDING
for BEST DISPERSIONS,
MOST EXCELLENT ADHESIONS,
FINEST GLOSS.

Natural Rubber, Nitrile Rubber, & Acrylic rubber solution in various solvents for paint additives & extenders.

We solicit your inquiries

CENTURY PRODUCTS CO.
DETROIT 38, MICH.

memo
Steve—
Heard your company is looking for a self contained hydraulic press
We've compared them all and found CLIFTON lowest in price — and feature for feature the finest press available
cordially
Ned

Whether you require a Standard or special Model, Remember to get a PRICE FROM CLIFTON—*Catalog mailed upon request* —

CLIFTON
HYDRAULIC PRESS CO.
303 Allwood Road Clifton, N. J.

The Important Qualities You Want In MAGNESIUM OXIDE For Rubber or Neoprene Compounding are AVAILABLE in DCI LIGHT CALCINED MAGNESIA

(Powdered or Granular)

REQUIREMENTS

★ MgO with low Fe_2O_3, Al_2O_3 and CaO content
★ Uniformity
★ Controlled Particle Size
★ Dust-free Grains
★ Lowest Manganese Content
★ Protective Packaging

★ These requirements are met completely by Darlington Chemicals Magnesium Oxide. Test and you'll know. Send for free sample today. Specify use.

DARLINGTON CHEMICALS INC.
1420 WALNUT STREET
PHILADELPHIA 2, PA.

Represented by
SUMMIT CHEMICAL CO., AKRON, OHIO
TUMPEER CHEMICAL CO., CHICAGO, ILL.

NATIONAL FORGE
Compression - Crush
TESTING MACHINES
For Rubber and Cushioning Materials

- Dual Loading Range 0-100 lbs. — 0-1000 lbs. A.S.T.M. Accuracy.
- Simple, permanently accurate mechanical weighing.
- Large, easy-to-read eye-level scale.
- Infinitely-variable speed.
- Improved Recorder, flat stress-strain graph. Start at any preload.

LARGER MACHINES OF 5000 and 10,000-lbs. AVAILABLE
TESTING MACHINE DIVISION
NATIONAL FORGE AND ORDNANCE CO.
Dept. R.A. Irvine, Warren County, Penna.

REVIEWS (CONT'D)

Automatic Proportioning Systems. (Bulletin No. 0351). Richardson Scale Co., Van Houten Avenue, Clifton, N. J. 8½ x 11 in. 28 pp.

A proportioning system that permits remote dialing of individual ingredient weights is pictured and described in this new, two-color bulletin. Besides describing how Richardson's "Select-O-Weigh" system works, the bulletin describes eleven installations in such varied operations as remote proportioning of oil shale, cement formulating, blending of feeds, net weighing with automatic tare composition, liquid latex blending, fully-automatic rubber compounding, differential weighing, glass batching, and maintaining tension on nylon fabric being processed. Forty-seven photographs and engineering drawings illustrate these installations. In addition, design and operating characteristics of the Richardson automatic proportioning system are explained.

•

How to Operate A Lift Truck. (Form No. 1214). Hyster Co., 2902 N.E. Clackamas Street, Portland 8, Ore. 8½ x 11 in. 24 pp.

This is the sixth edition of this publication which is designed to aid lift truck operators, supervisors, safety engineers and other interested personnel in the operation of lift trucks. The two-color cartoon technique used in the booklet is designed for easy reading and is packed with information about the operation of a lift truck, preventive maintenance, safety and basic materials handling. Planned for use as part of an operator training program, the booklet is slanted both for the beginner and the experienced operator. It can be studied by the operator himself, or used as a guide by instructors.

•

Chlorowax in Flame-Retardant Rubber Compounds. Chlorinated Products Division, Diamond Alkali Co., 300 Union Commerce Building, Cleveland 14, Ohio. 8½ x 11 in. 16 pp.

This technical bulletin concisely reviews the use of two chlorinated paraffins—Chlorowax 40 and Chlorowax 70—for improving the flame retardance of rubber compounds. The principal functions and advantages of Chlorowax 70 in its application as a resinous modifier with all types of elastomers are outlined, and similar treatment is given to Chlorowax 40 when used as a nonflammable plasticizer and softener for rubber stocks. Twelve typical compounds and their recommended applications are listed. Elastomers utilized include several types of GR-S, neoprene, nitrile rubber, reclaimed rubber, and both natural and synthetic latices.

•

Forty Precision Finishing Operations. (Bulletin No. 451-D). American Wheelabrator and Equipment Corp., 1290 S. Byrkit Street, Mishawaka, Ind. 8½ x 11 in. 20 pp.

Precision cleaning and finishing is the subject of this comprehensive new brochure. Dealing with the wet abrasive blasting process, the publication presents 40 frequently-met applications in which this process can be profitably used. Most of them are illustrated. A section of the brochure is also devoted to describing the process itself, in which water-suspended abrasives are thrown at high velocity upon the work. The necessary equipment is also mentioned.

•

Cellosolve and Carbitol Solvents. (Bulletin No. F-4765). Carbide and Carbon Chemicals Co., 30 East 42nd Street, New York 17, N. Y. 8½ x 11 in. 40 pp.

The nine commercial glycol-ethers sold by the company are described in detail in this booklet. An important feature of the publication is a section devoted to the specifications of the glycol-ethers and the test methods used by the company to check these specifications. These laboratory control tests comprise some of the standard A.S.T.M. methods and methods that have been specially developed in the company's laboratories.

Butaprene Paint Latices for Styrene-Butadiene Latex Paints. (Sales Service Bulletin No. B-4). Chemical Sales Division, Firestone Plastics Co., Pottstown, Penna. 8½ x 11 in. 8 pp.

This bulletin has been prepared to acquaint the paint chemist with the fundamentals of formulating latex paints using Firestone Butaprene paint latex, a styrene-butadiene copolymer. The publication illustrates the fact that the stability of Butaprene paint latices makes them easy tools for the paint manufacturer who wants to formulate excellent latex paints. The bulletin lists the requirements of a latex necessary for the development of maximum paint properties, and lists those properties required of a typical latex paint. The formulation of a typical paint is also outlined.

•

How to Pack It. Hinde & Dauch, Sandusky, Ohio. 8½ x 11 in. 32 pp.

This booklet describes and illustrates a unique selection of twelve different styles and more than seventy different types of corrugated boxes for a variety of products. Shelf and counter, display, luggage style, "prepaks," Duplex (combination shipping and display) and a new "Hevi-Duty" box for high density products are but a few of the H & D boxes included in the portfolio. In addition, descriptive copy for each box suggests proper methods of sealing, packaging, and displaying. For companies who are interested in the development of a package for a new product, or the improvement of an existing one, this booklet offers an excellent source of ideas.

•

Quality Control and Research. Scientific Apparatus Makers Association, 20 North Wacker Drive, Chicago 6, Ill. 6 x 9 in. 24 pp.

Higher living standards and increased competition are making it practically a must for even the smallest processor or manufacturer to take a look at the growing technology around him. This booklet points out that volume buyers on the American scene are constantly increasing their demands upon the manufacturer for goods that are produced according to specification. The booklet cites examples on the establishment of quality control laboratories in smaller manufacturing establishments and points out benefits to be obtained from their use.

•

The Story of Achievement. Francis Shaw & Co., Ltd., Manchester, England. 8 x 10½ in. 24 pp.

The year 1954 marked the 75th anniversary of Francis Shaw & Co., Ltd. This booklet marks the occasion by detailing the history of the company, including its early activities and present status. Many of the products now manufactured by the company are described and illustrated, while the activities of the Export Department are emphasized. Interesting photographs depict various scenes in the Manchester plant and show some of the work carried on there.

"WINDSOR CLAY"

The Ideal
HARD RUBBER CLAY

A Sample and Technical Data are yours for the asking.

UNITED CLAY MINES
CORPORATION
TRENTON, NEW JERSEY

DPR®

100% ALL RUBBER SOLIDS

Natural & synthetic rubbers in flowable form.

Also special grades having superior compatibility with asphalt and polyethylene.

TECHNICAL LABORATORY INFORMATION AND SAMPLES UPON YOUR REQUEST

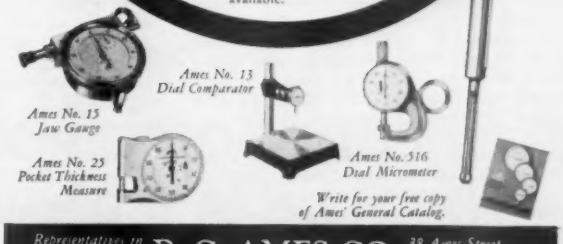
ORIGINATORS OF QUALITY DEPOLYMERIZED RUBBERS "SINCE 1906"

DPR, INCORPORATED
A Subsidiary of H. V. HARDMAN CO.
571 CORTLANDT STREET
BELLEVILLE 9, N. J.

AMES

...the *Preferred* Small Hole Gauge No. 36

Skilled and unskilled employees can use this superbly designed two-point contact gauge to make quick, accurate, *impersonal* inspections of small holes for size, taper and roundness. The spherical contact point automatically centers itself and indicates the true diameter at the point measured. The Ames Small Hole Gauge No. 36 checks holes with 3/16" to 1" diameter, up to 2" deep. Longer lengths and special contacts to check irregular recesses, splines, available.



Write for your free copy of Ames' General Catalog.

Representatives in principal cities. B. C. AMES CO. *38 Ames Street Waltham 54, Mass*

Mfgr. of Micrometer Dial Gauges • Micrometer Dial Indicators

MARKETS

NEWS-PRICES

NEW YORK, MAR. 3, 1955

Natural Rubber

Since our last report (February 3), the average price of spot rubber on the New York Commodity Exchange has moved in the extremely wide range of 837 points, high for the period being 37.75c reached on February 10 and again on February 11, and low being 29.38c reached on March 3. The average price of spot rubber for the month of February was 34.90c based on 19 trading days. This compares with an average of 33.92c in January.

The trade reports that one by one the bullish factors in rubber are falling by the wayside. A most impressive case in point was Malayan production for December which amounted to over 55,000 tons, or as much as 8,000 tons in excess of estimates. January production was over 57,000 tons, whereas a production of under 50,000 was expected. This clearly indicates the stimulus which price is to production.

It is to be noted that as a result of a break in prices in the latter part of February, Malayan rubber traders are estimated to have lost more than $3,000,000 in U. S. funds. The market break was generally attributed to speculators in Singapore and the new stockpile rotation program announced by the General Services Administration.

The trade believes that the high rate of consumption in the United States will continue for a little while longer. The impression exists, however, that consumers have substantially anticipated requirements through April and even beyond. The tightness in the nearby position of rubber is said to have eased materially.

Natural Rubber Production

World production of natural rubber in 1954 was up 4.5% from the year before, according to the Secretariat of the International Rubber Study Group. This made 1954 the third largest production year, being surpassed only by 1950, with 1,860,000 long tons, and the 1,885,000 long tons produced in 1951.

World consumption of natural rubber in 1954 was up 6.8% from 1953 to set a new world record of 1,725,000 long tons. Consumption in 1953 amounted to 1,615,000 long tons.

It is interesting to note that the U. S. consumption of natural rubber last year was some 23,000 long tons below the projected estimate of the Rubber Study Group, while synthetic rubber consumption was 20,000 long tons greater than the estimate. Another interesting point is that synthetic rubber consumption in Europe in 1954, while only 49,500 long tons, showed an increase of 10% from the Rubber Study Group's original estimate. Synthetic consumption in Europe in 1954 was some 23% greater than the consumption in 1953.

The Rubber Manufacturers Association reports that in January of this year, 57,299 long tons of natural rubber were consumed in the United States. This is a 3.8% increase over the previous month and 22% above January, 1954. As a matter of fact, consumption of new rubber in the U. S. in January, 1955, was exceeded only twice in history, in March and April of 1953.

Price Data

Closing Rubber Prices on New York Commodity Exchange (No. 1 R.S.S. Contract)

FROM FEBRUARY 4 TO MARCH 3

Feb.	Spot	May	July	Sept.	Dec.	Sales
4	35.88	35.55	35.05	34.60	34.10	45
5	....	....	....	....	....	....
6	....	....	....	....	....	....
7	36.25	35.50	34.95	34.55	34.05	129
8	36.75	35.95	35.40	34.95	34.35	110
9	37.00	35.95	35.50	34.95	34.60	105
10	37.75	36.50	35.95	35.50	34.95	195
11	37.75	37.00	35.95	35.45	34.90	97
12	....	....	....	....	....	....
13	....	....	....	....	....	....
14	36.88	35.65	34.70	34.30	33.70	129
15	35.25	34.45	33.60	33.00	32.60	155
16	34.25	33.25	32.60	32.05	31.60	232
17	34.25	33.50	33.05	32.50	32.10	349
18	33.38	32.65	32.30	31.90	31.65	322
19	....	....	....	....	....	....
20	....	....	....	....	....	....
21	32.75	32.00	31.60	31.35	30.90	159
22	....	....	....	....	....	....
23	33.75	33.25	32.85	32.45	32.10	239
24	31.62	31.40	31.05	30.65	30.45	278
25	32.00	31.80	31.35	31.00	30.70	113
26	....	....	....	....	....	....
27	....	....	....	....	....	....
28	30.88	30.35	30.10	29.80	29.35	117
Mar.						
1	30.12	29.70	29.45	29.00	28.70	232
2	30.62	30.30	30.00	29.55	29.25	250
3	29.38	29.40	29.00	28.75	28.35	241

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.29⅜
March	.29¼
April	.29⅛
Thin Latex Crepe:	
Spot	.32½
Thin Brown Crepe, No. 2	.28
Flat Bark Crepe	.25½

London Market

(Standard Smoked Sheets)

Apr.-June	28.77 - 28.92
July-Sept.	28.48 - 28.63

Singapore Market

(Standard Smoked Sheets)

April	28.37 - 28.44

Synthetic Rubber

(Dry Types—Per Pound)

Butaprene NF	.490 - .500
Butaprene NL	.500 - .510
Butaprene NAA	.540 - .550
Butaprene NXM	.580 - .590
Chemigum 30N4NS	.500 - .510
Chemigum 50N4NS	.500 - .510
Chemigum N3	.580 - .590
G-E Silicone Rubber (compounded)	2.50 -3.60
G-E Silicone Gum (not compounded)	4.00 -4.20
GR-I	—— - .230
GR-S	—— - .230
Hycar OR-15	.580 - .590
Hycar OR-25	.500 - .510
Hycar OS-10	.550 - .560
Neoprene Types AC and CG	—— - .550
Neoprene Type GN	—— - .410
Neoprene Type GN-A	—— - .410
Neoprene Type GRT	—— - .420
Neoprene Type KNR	—— - .750
Neoprene Type S	—— - .420
Neoprene Type W	—— - .330
Neoprene Type WRT	—— - .450
Paracril B	.500 - .510
Paracril BJ	.500 - .510
Paracril C	.580 - .590
Polysar "S" Types	—— - .230
Polysar Butyl Types	—— - .230
Polysar Krynol	—— - .189
Polysar Krynol NS	—— - .194
Polysar Krynac	.500 - .510
Polysar Krynac 801	.580 - .590
Polysar SS-250-K	.300 - .310
Silastic (compounded)	1.95 - .338
Thiokol Type A	—— - .470
Thiokol Type FA	—— - .640
Thiokol PR-1	—— - .950
Thiokol Type ST	—— -1.000

Middling Upland Quotations

	Feb. 3	March 3		
	Close	High	Low	Close
March	34.61	34.06	33.91	33.91
May	34.93	34.30	34.11	34.11
July	35.13	34.56	34.36	34.36

Synthetic Rubber

With little Congressional opposition expected to develop over the transfer of the government-owned synthetic rubber facilities to private ownership, news during the past few weeks has centered on questions of markets and price once the transfer actually is effected.

Some intimations of objection to the contemplated transfer came from a Senate Banking subcommittee which was scheduled to hold a hearing on the subject on March 8. Senator Alan J. Frear (Dem., Del.), chairman of the Subcommittee on Production and Stabilization, said the hearings were prompted by "substantial complaints" received by subcommittee members against the sale of certain of the plants. The trade does not expect, however, that these complaints will have much bearing on eventual disposal.

Estimated Price Range

On the question of price, the evidence on hand seems to indicate that the delivered price for principal tire grades of synthetic rubber will range from 24 to 25c a pound. As reported in the February, 1955, issue of RUBBER AGE, Firestone and Shell Chemical have announced a flat 23c a pound price, f.o.b. producing plant, while Phillips Chemical has placed a 25c delivered selling price on its synthetic.

For some time, the government has been selling its GR-S at 23c a pound, f.o.b. producing plant, plus a uniform freight charge of 1.1c a pound. Natural rubber is currently selling at about 30c a pound at New York. It had long been felt by many in the trade that disposal of the government plants to private industry would result in an immediate increase of 2c or more in the price of synthetic rubber.

The Rubber Producing Facilities Disposal Commission has announced contracts covering eleven GR-S plants with a combined annual production capacity of 689,000 long tons. The three firms which have disclosed their price plans account for about one-third of this total.

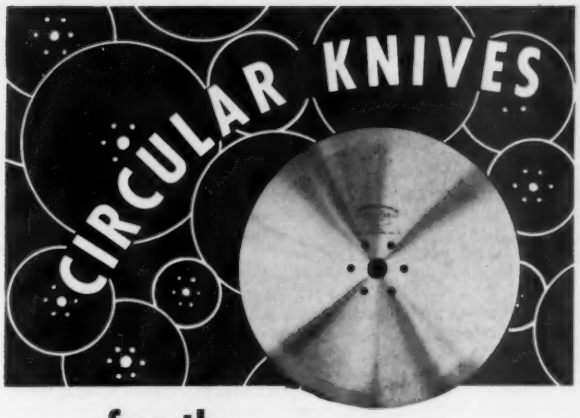
Firestone, it is understood, has announced the 23c a pound price only for the 99,600 long ton copolymer unit it has contracted for at Lake Charles, La. The terms have not been applied, it is believed, to a second plant, the 30,000 long ton unit at Akron, Ohio.

Under government ownership, the Lake Charles plant marketed 90% of its production in 1953 (the last year for which figures are available) east of the Mississippi. More than half its output went to delivery points in Ohio and nearby states. Freight rates prevailing in late 1953 from Lake Charles ran to about 1.5c a pound to New Jersey, 1.25c a pound to Ohio, and 1.87c to Los Angeles.

West Coast Market

Shell, which has contracted for the 89,000 long ton GR-S plant at Los Angeles, offered the 23c a pound f.o.b. price to consumers in an eight state West Coast market. Shell, which does not consume rubber, is expected to find its major outlet among the Los Angeles tire plants of the nation's four major rubber companies. Freight charges from Los Angeles to New Jersey ran about 2.41c a pound in late 1953; and to Akron, about 2.12c.

Phillips has agreed to sell the major output from the 63,000 long ton Borger, Texas, plant to smaller rubber manufacturers. Freight costs were about 1.8c a pound to New Jersey in late 1953; 1.5c to Akron, and 1.72c to California.



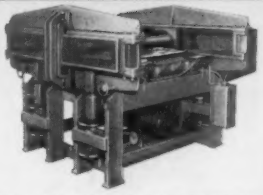
for the
RUBBER INDUSTRY

Our Circular Knives have been used by the largest rubber companies for over 25 years. Made from special analysis steel for long edge holding qualities, true running for better cutting.

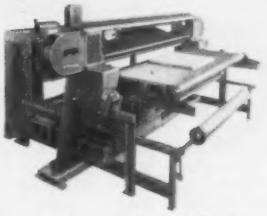
Made in sizes from 4" to 24" diameter—any thickness. Send drawing for quotations and delivery.

THE F. HEINEMANN SAW AND MFG. CO.
CANTON 6, OHIO

Campbell SPECIAL MACHINES



Campbell ROLLER DIE CUTTER, standard and heavy duty models. Die cuts many materials, trims molded rubber goods.



Campbell FOAM RUBBER SPLITTER for natural and synthetic foam, other materials. Splits most stock to 1/8" thickness.

Campbell FOAM RUBBER CUSHION CUTTER best for fabricating cushioning and seating material and for leveling stock before splitting.

Call, write or wire TODAY!

The FALLS ENGINEERING AND MACHINE CO.
Est. 1917
1734 FRONT ST., CUYAHOGA FALLS, O.

Trade Mark

HEVEATEX
CORPORATION
78 GOODYEAR AVENUE
MELROSE 76, MASS.

BRANCHES: CHICAGO, ILL. AKRON, O. DETROIT, MICH. LOS ANGELES, CAL.

Natural and Synthetic
Latex and Latex Compounds
for all purposes

MARKETS NEWS-PRICES

NEW YORK, MAR. 3, 1955

Reclaimed Rubber

Preliminary estimates by the U. S. Department of Commerce indicate that 256,894 long tons of reclaimed rubber were produced in 1954, and 975 long tons imported, making for a total new supply of 257,869 long tons. In 1953, new supply amounted to 298,336 long tons, including 295,550 long tons produced and 2,786 imported.

Consumption of reclaimed rubber in 1954 was set at 248,778 long tons by the Commerce Department. This compares with the 285,050 long tons consumed in 1953. A total of 10,251 long tons of reclaim were exported in 1954, against the 11,397 long tons exported in the previous year.

As of December 31, 1954, there were 31,199 long tons of reclaimed rubber on hand. This compares with the 32,319 long tons on hand as of December 31, 1953.

The market continues its fairly stable tone with most grades exceeding or at least meeting conditions at this time in 1954.

(Prices for All Areas Except Calif.)

	per lb.
Premium Grade Whole Tire	.10½
First Line Whole Tire	.10
Second Line Whole Tire	.09½
Third Line Whole Tire	.09¼
Fourth Line Whole Tire	.08¾
Black Carcass	.14¼
No. 1 Light Colored Carcass	.20¾
No. 1 Select Peel	.11¾
No. 1 Peel	.10½
Butyl Tube Reclaim	.15
Natural Rubber Black Tube	.15
Natural Rubber Red Tube	.21
Natural Rubber Gray Tube	.21

Scrap Rubber

Demand for Butyl tubes is reported to have slackened considerably. Buyers are reported to have satisfied most of their requirements. In recent weeks, there has been little activity in other grades of rubber scrap and prices remain generally unchanged from previously quoted levels.

Trade quarters are generally not optimistic about export business in scrap rubber. Some factors point out that overseas buyers have been able to obtain supplies closer to home and often at prices below those quoted in the United States.

Inclement weather in some areas is said to have slowed activity somewhat. Most dealers decline to predict what may be in store for the scrap rubber market in the second quarter of the current year.

(Prices Delivered Akron)

Mixed tires	ton	14.50
Light colored carcass	lb.	.05½
No. 1 peelings	ton	45.00
No. 2 peelings	ton	30.00
No. 3 peelings	ton	24.00
Buffings	ton	17.00
Truck and Bus S.A.G.	ton	17.00
Passenger S.A.G.	ton	15.00
Natural Rubber Red Tubes	lb.	.08
Natural Rubber Black Tubes	lb.	.05¼
Butyl Rubber Tubes	lb.	.07

Tire Fabrics

The U. S. Bureau of the Census reports that the 1954 fourth quarter output of tire cord and tire cord fabric totaled 117,097,000 pounds, 44% higher than in the third quarter and 4% higher than in the last quarter of 1953. Rayon cord and fabric accounted for 91,540,000 pounds of the fourth quarter total. This was 45% above the previous quarter, but 2% below the fourth quarter of 1953. Nylon cord and fabric output, at 9,338,000 pounds, was up 38% from the third quarter and 78% above the last quarter of 1953.

Cotton cord and fabric output amounted to 16,219,000 pounds in the final quarter of 1954, compared with 11,425,000 pounds in the third quarter and 14,029,000 in the last quarter of 1953. End-of-year stocks of cotton and synthetic tire cord and fabrics totaled 54,715,000 pounds, about the same as at the end of the third quarter.

Belt Duck Demand Strong

The trade reports that substantial quantities of belting duck have been selling for forward delivery in recent weeks, and prices of these and most other ducks were displaying a firmer tone. A particularly strong demand for belting ducks was evident in the export market, trade sources said.

Chafer fabric prices, on the other hand, ran contrary to the general trend as leading mills reduced their quotations from 3 to 4c a pound. The sharp reduction in chafer fabric prices in the face of a firming market in all other types of cotton ducks can be attributed, trade observers state, to recent developments in the tire field.

The market for chafer fabrics has been shrinking slowly over the past few years due mainly to the increasing use of tubeless tires. Chafer linings are not used in tubeless tires and it is expected that the growing use of these tires eventually will eliminate chafer fabrics entirely.

Chafer fabrics actually have been selling under list price for some time, the trade reports, and leading producers have decided to adjust their quotations down to realistic levels. While the over-all volume of chafer fabrics sold will not be increased by the price reduction, greater competition evidently has developed in the remaining chafer market.

DuPont Raises Prices

DuPont has announced a price increase of 3c a pound on "Cordura" and "Super Cordura" high tenacity rayon. All textile rayon through 200 denier, including semi-high tenacity "Textile Cordura" has been advanced 5c. The new prices are effective with orders of March 7.

(Prices f.o.b. Shipping Point)

Rayon Tire Cord

1100	lb.	.76½
1650	lb.	.73½
2200	lb.	.73

Nylon Tire Cord

210	lb.	2.00
840	lb.	2.00

Rayon Graded Fabric

1100	lb.	.72
1650	lb.	.69½
2200	lb.	.68½

Cotton Chafers

14.4 oz. (per square yard)	lb.	.71
9.25 oz. (per square yard)	lb.	.66½
11.65 oz. (per square yard)	lb.	.62
8.9 oz. (per square yard)	lb.	.68

Liquid Latex

Natural: Latex & Rubber, Inc., reports that the market for Hevea latex in the U. S. continues strong. January will doubtless prove to be the greatest calendar month of U. S. consumption, surpassing the 8,000 ton monthly average consumption in November and December of 1954. At least one recent estimate of U. S. Hevea latex consumption shows monthly usage exceeding 8,000 long tons in the first half of 1955.

March and April supplies are said to be very limited. It is reported that there is enough interest in the market to quickly take up all available quantities through April and soon May availabilities will vanish. The trade reports that ASTM Centrifuged Latex ranges from 41-46c, f.o.b. East Coast entry, for spot or nearby deliveries.

Synthetic: It is reported that 40-45c Hevea latex prices have caused consumers to utilize GR-S latices, priced under 30c a pound, to the maximum. FFC has tried to meet the demand with all existing facilities. While most all GR-S latex demands have been met, some difficulties may be experienced in the weeks ahead.

Varying estimates have been expressed as to the time required to expand "cold" latex production once the question of private or government ownership is finally decided. Some say substantial new quantities could not be made available before December, 1955, or January, 1956, whereas others claim September, 1955, would see new facilities producing worthwhile quantities.

Cotton

The price of middling uplands on the New York Cotton Exchange has moved in the rather narrow range of 50 points since our last report (February 3), high for the period being 35.10 reached on February 4, 10, 11, 21 and 25, and low being 34.60c reached on March 3. The average price of middling uplands for the month of February was 35.04c based on 19 trading days. This compares with an average of 35.07c in January.

Senator John J. Sparkman (Dem., Ala.) has called for a 1,387,000 acre increase in the national cotton acreage allotment, charging that the "insignificant increase" in the 1954 carryover does not justify the "drastic" reduction in the 1955 acreages ordered by the Agriculture Department. Senator Sparkman said that the Administration's flexible price supports system, and the acreage cut, are certain to work hardships on cotton growers and other cotton industry groups.

Late in February, the Agriculture Department announced the minimum level of price support for 1955 crop upland and extra long staple cotton. The minimum level of price support for upland cotton, basis middling ⅞-inch, will be 31.70c per pound gross weight. The minimum level of support for 1955 crop extra long staple cotton will be 55.20c per pound, net weight. These levels reflect 90 and 75%, respectively, of the current parity price of 35.22c and 73.60c per pound, for upland and extra long staple cotton. Marketing quotas will be in effect for both 1955 crop upland and extra long staple cotton but compliance will be considered independently for each crop.

Now . . . Up-To-The-Minute

INTERNATIONAL TECHNICAL ASSISTANCE

- To tire and other rubber manufacturers abroad, who desire to learn the latest American "Know-How" . . . cut manufacturing costs—we offer comprehensive Technical Assistance at low cost.
- Dayton Rubber's I.T.A. plan has been in existence for 20 years. Rubber experts and teachers that give unexcelled technical assistance at a surprisingly nominal cost . . . all backed by 48 years of recognized leadership in the rubber industry . . . with 4 U. S. plants.
- We train your personnel in these modern plants . . . help you establish the latest formulae for processing natural and all new types of synthetic rubbers and textiles . . . latest "Know-How" in Tubeless Tires, Butyl Tubes, Rayon and Nylon Cords, Carbon Blacks. We also design factories and supervise machinery installations if desired.

Write: International Technical Assistance Division

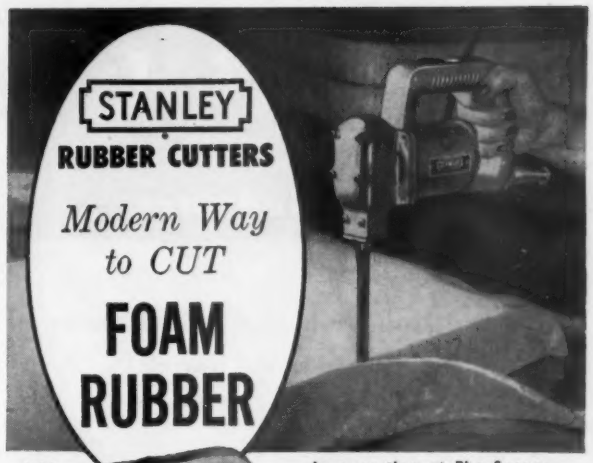
INTERNATIONAL TECHNICAL ASSISTANCE DIVISION I.T.A. THE DAYTON RUBBER CO. DAYTON, OHIO

Dayton Rubber

Dayton 1, Ohio, U. S. A.
Cable Address: Thorobred

SINCE 1905, MANUFACTURERS OF TIRES AND TUBES

STANLEY
RUBBER CUTTERS
Modern Way to CUT
FOAM RUBBER



NOS. 994-996

In operation at The Sponge Rubber Co., Inc., Shelton, Conn.

No Pinch • No Waste
Cuts Even • Cuts Quicker

Operator can follow template or any marked pattern. Cuts straight lines, curves or angles at up to 30 ft. a minute. For further information write, 693 Myrtle St., New Britain, Conn.

STANLEY *Electric Tools*

HARDWARE • TOOLS • STEEL STRAPPING • STEEL

• CRUDE RUBBER
• LIQUID LATEX
• CHEMICALS

E. P. LAMBERT CO.

FIRST NATIONAL TOWER
AKRON 8, OHIO
HEmlock 4-2188
MEMBER — COMMODITY EXCHANGE, Inc.

Coumarone Resins — Reclaiming Oils — Plasticizers
Powdered Rubber

STATISTICS

of interest to the rubber industry

Natural Rubber in the United States

(Including Latex and Guayule)

(All Quantities in Long Tons)

Year	New Supply	Consumption	Re-Exports	Stocks On Hand at End of Period
1926	417,643	366,200	17,671	72,510
1927	431,246	373,000	27,775	99,282
1928	439,731	437,000	32,159	65,454
1929	565,087	467,400	36,485	118,609
1930	487,628	376,000	30,205	201,000
1931	501,788	355,200	25,609	322,000
1932	414,668	336,700	20,937	379,000
1933	418,902	412,400	20,576	365,000
1934	463,018	462,500	23,856	355,000
1935	467,146	495,500	11,391	303,000
1936	488,145	575,000	12,582	223,000
1937	600,479	543,600	7,902	262,204
1938	411,983	437,031	5,652	231,500
1939	499,473	592,000	13,125	125,800
1940	818,243	648,500	7,060	288,864
1941	1,029,007	775,000	5,376	533,344
1942	282,653	376,791	10,856	422,714
1943	55,329	317,634	20,815	139,594
1944	107,834	144,113	9,665	93,650
1945	135,672	105,429	6,743	118,715
1946	400,687	277,597	4,338	237,467
1947	688,354	562,661	4,101	129,038
1948	735,227	627,332	6,673	141,541
1949	660,792	574,522	6,253	106,619
1950	802,249	720,268	8,644	89,215
1951	733,048	454,015	2,603	76,569
1952	805,997	453,846	3,024	95,260
1953	647,150	553,473	8,376	112,316
1954	596,861	597,530	7,522	102,458
1954:				
Mar.	47,721	53,709	460	112,829
Apr.	49,855	51,451	918	106,564
May	55,983	51,398	355	104,377
June	66,698	54,253	524	104,541
July	40,614	39,894	565	109,564
Aug.	59,124	38,069	359	124,810
Sept.	48,618	52,412	499	119,191
Oct.	49,432	55,970	904	115,970
Nov.	45,474	53,326	800	105,025
Dec.	43,557	55,191	852	102,458

Source: U. S. Department of Commerce.

U. S. Imports of Natural Rubber

Year	Dry: Long Tons	Dry: Declared Value	Latex: Long Tons	Latex: Declared Value	Total Imports
1937	574,600	237,307,041	23,185	10,213,670	597,785
1938	397,640	125,373,864	11,944	4,168,127	409,584
1939	469,946	167,586,780	27,437	10,467,552	497,383
1940	781,202	303,308,823	33,789	14,593,466	814,991
1941	989,498	401,976,317	34,797	15,965,627	1,024,245
1942	266,276	112,537,426	10,646	5,630,667	276,922
1943	50,358	31,369,198	1,890	1,312,202	52,248
1944	103,847	73,908,549	3,091	2,092,211	106,938
1945	134,408	95,814,102	4,773	3,115,853	139,181
1946	376,502	228,796,110	8,421	5,843,085	384,923
1947	691,087	306,951,814	17,542	9,787,722	708,629
1948	702,293	290,849,177	32,745	18,288,223	735,038
1949	630,808	225,343,624	29,743	14,968,650	660,551
1950	747,109	416,222,598	54,401	41,764,486	801,510
1951	677,874	727,343,348	54,963	80,178,309	732,837
1952	756,987	578,179,519	48,228	40,563,116	805,215
1953	571,635	284,909,223	75,511	46,353,333	647,146
1954:					
Mar.	42,039	15,823,475	5,682	3,031,963	47,721
Apr.	44,193	16,605,910	5,663	2,855,180	49,856
May	52,177	19,493,956	3,806	1,907,249	55,983
June	60,108	23,432,566	6,590	3,515,531	66,698
July	35,334	14,694,340	5,236	2,915,484	40,570
Aug.	51,553	22,840,397	7,571	4,374,067	59,124
Sept.	42,138	18,658,983	6,480	3,904,819	48,618
Oct.	42,221	19,902,225	7,210	4,469,492	49,431
Nov.	39,139	19,244,326	6,335	3,944,396	45,474

Source: Bureau of the Census, U. S. Department of Commerce.

World Production of Natural Rubber

(Including Latex)

(Long Tons)

Year	Malaya	Indonesia	Ceylon	Viet Nam & Cambodia	Latin America	Rest of World*	Total*
1942	155,000*	200,000*	101,500	76,177	35,794	71,476	640,000
1943	75,000*	100,000*	105,500	70,370	41,900	72,507	465,000
1944	25,000*	50,000*	98,500	60,419	49,946	77,002	360,000
1945	8,600*	10,000*	97,500	12,000*	47,125	73,570	250,000
1946	403,719	175,000*	94,000	19,975	39,678*	105,080	837,500
1947	646,362	277,951	89,000	38,128	34,928*	172,792	1,260,000
1948	698,189	432,349	95,000	43,935	29,158*	226,056	1,525,000
1949	671,503	432,996	89,500	43,010	27,318*	225,907	1,490,000
1950	694,090	696,472	113,500	48,482	26,902*	279,541	1,860,000
1951	605,346	814,406	105,000	52,136	29,777*	277,716	1,885,000
1952	584,238	749,241	96,500	63,134	35,475*	260,111	1,790,000
1953	574,390	692,164	98,610	74,545	35,318*	249,894	1,725,000
1954:							
Apr.	40,223	58,217	7,246	4,436	2,978*	19,088	132,500
May	46,285	55,748	5,296	5,738	2,441*	17,707	132,500
June	43,202	54,696	7,713	6,232	1,281*	23,509	137,500
July	54,014	72,970	8,014	7,160	2,158*	22,794	165,000
Aug.	52,509	58,980	7,961	6,650	1,685*	21,220	150,000
Sept.	53,552	70,013	8,229	6,345	2,317*	23,741	165,000
Oct.	50,251	69,518	7,545	7,403	500*	16,669	162,500
Nov.	54,834	61,078	9,893	....	500*	16,813	162,500
Dec.	54,644	.....	11,157	....	.....	.....	.....

Source: International Rubber Study Group. * Estimated.

World Consumption of Natural and Synthetic Rubber

(Including Latex)

(Long Tons)

Year	United States	United Kingdom	Canada	Europe*	Rest of World*	Total*
1943	488,525	66,730	32,896	150,000	156,104	907,500
1944	710,783	86,977	34,310	132,500	160,690	1,125,000
1945	799,009	91,047	41,836	87,500	108,164	1,127,500
1946	1,039,296	126,770	39,196	145,000	115,804	1,467,500
1947	1,122,327	156,399	61,452	242,500	153,548	1,735,000
1948	1,069,404	196,286	62,121	392,000	182,379	1,902,500
1949	988,903	186,622	56,362	446,500	207,388	1,887,500
1950	1,258,557	222,425	68,695	448,500	287,055	2,285,000
1951	1,214,298	238,101	70,809	476,500	314,941	2,312,500
1952	1,261,413	202,179	67,099	550,000	254,901	2,335,000
1953	1,338,309	211,453	73,394	521,000	343,606	2,487,500
1954:						
Mar.	109,769	19,796	6,519	46,250	30,981	212,500
Apr.	105,105	20,432	5,972	42,500	43,028	217,500
May	104,026	19,523	6,202	42,000	28,548	200,000
June	111,448	18,713	6,461	41,000	30,039	207,500
July	79,446	18,295	4,758	42,500	29,492	175,000
Aug.	80,120	14,902	4,774	38,250	36,476	175,000
Sept.	106,290	20,114	6,269	45,000	39,731	217,500
Oct.	114,279	24,105	5,756	47,500	30,994	222,500
Nov.	110,445	19,945	6,503	47,750	29,997	215,000
Dec.	118,843	.....	....	.....	.....	.....

Source: International Rubber Study Group. * Estimated.

U. S. Gross Imports of Balata, Jelutong, Gutta-Percha, etc.

(All Quantities in Long Tons)

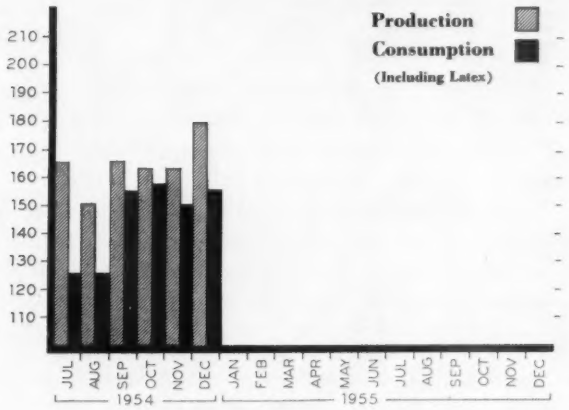
Year	Balata: Tons	Balata: Value	Jelutong: Tons	Jelutong: Value	Gutta-Percha & Other Guttas: Tons	Gutta-Percha & Other Guttas: Value
1943	1,047	708,701	35	14,840	....	.....
1944	1,012	660,805	88	45,578	10	4,999
1945	1,361	907,253	....	.....	36	21,970
1946	2,281	2,233,065	304	256,169	423	458,064
1947	1,982	2,276,531	2,878	1,496,887	392	779,591
1948	1,195	805,078	3,401	2,377,765	423	542,788
1949	1,391	814,554	1,043	834,978	197	189,021
1950	2,117	1,589,885	1,789	1,515,162	541	745,418
1951	2,452	1,973,271	1,669	2,608,359	383	430,539
1952	988	762,994	1,636	2,094,983	282	385,890
1953	1,619	866,248	1,027	1,166,837	235	303,116
1954:						
Jan.	61	30,769	74	60,746	9	23,425
Feb.	44	18,583	98	88,964	33	28,464
Mar.	19	22,053	59	73,541	19	17,213
Apr.	131	64,025	226	312,654	54	45,733
May	90	35,350	192	232,496	27	37,329
June	87	36,745	318	392,687	97	126,979
July	104	54,957	201	240,477	24	37,749
Aug.	30	23,404	151	200,944	58	68,298
Sept.	107	43,193	313	335,832	37	32,492
Oct.	85	49,323	263	328,656	14	24,116
Nov.	108	76,392	156	188,426	27	49,170

Source: U. S. Department of Commerce.

STATISTICS at a glance

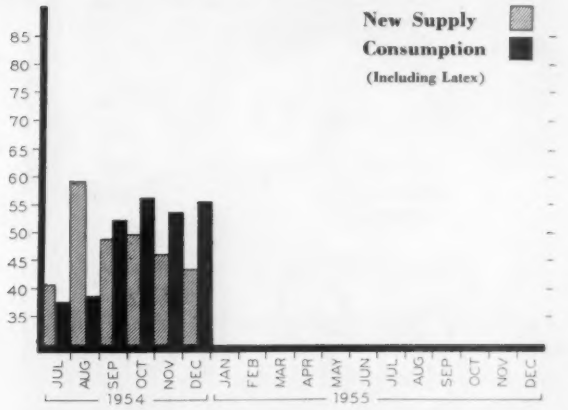
NATURAL RUBBER—WORLD

(thousands of long tons)



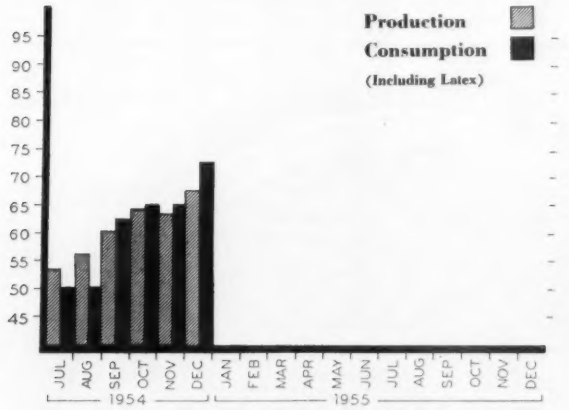
NATURAL RUBBER—UNITED STATES

(thousands of long tons)



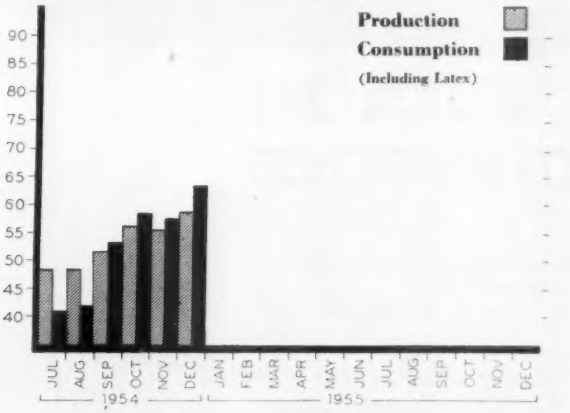
SYNTHETIC RUBBER—WORLD

(thousands of long tons)



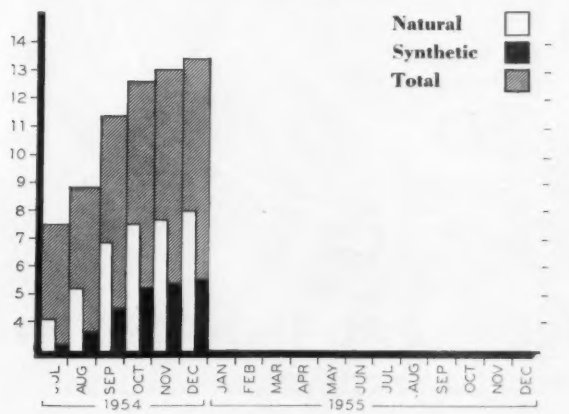
SYNTHETIC RUBBER—UNITED STATES

(thousands of long tons)



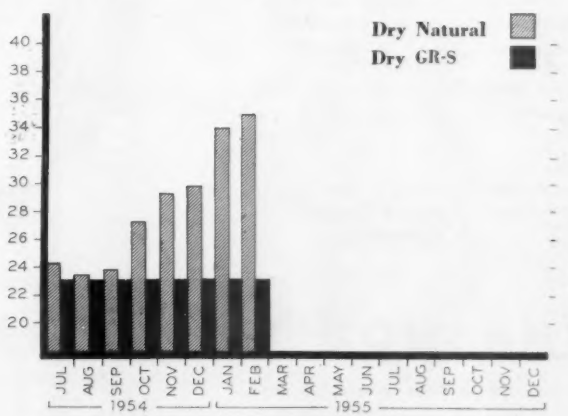
LATEX CONSUMPTION IN THE U. S.

(thousands of long tons)



PRICES—NATURAL AND SYNTHETIC

(cents per pound)



Synthetic Rubber in the United States

(All Quantities in Long Tons)

New Supply

Year	GR-S	Neoprene	Butyl	N-Type	Total
1946	613,408	47,766	80,823	5,738	747,735
1947	408,858	31,495	62,824	6,618	509,795
1948	405,492	34,848	56,662	7,012	504,014
1949	310,529	35,215	54,046	11,072	410,932
1950	378,887	50,067	60,915	12,037	501,906
1951	704,529	58,907	76,475	15,333	855,244
1952	654,854	65,745	81,630	16,228	818,447
1953	680,728	80,495	79,801	20,198	861,222
1954	490,487	69,150	58,802	21,396	639,835
1954:					
Mar.	44,464	5,190	5,214	1,900	56,768
Apr.	35,551	5,601	6,004	1,645	48,801
May	36,237	4,828	4,581	1,960	47,606
June	37,092	5,101	3,182	1,696	47,071
July	36,803	4,673	4,960	1,814	48,250
Aug.	38,646	5,313	5,003	1,624	50,586
Sept.	41,120	6,036	4,675	1,718	53,549
Oct.	43,938	6,644	5,117	1,864	57,563
Nov.	43,130	6,839	5,060	1,913	56,942
Dec.	47,438	6,206	4,666	2,068	60,378

Consumption

1946	632,126	44,357	79,228	5,988	761,699
1947	448,589	37,703	65,838	4,536	559,666
1948	345,313	32,118	58,870	5,771	442,072
1949	299,420	31,753	50,855	8,827	414,381
1950	416,230	43,781	66,348	11,930	538,289
1951	626,444	48,887	70,500	13,066	758,897
1952	666,420	55,522	71,229	13,866	807,037
1953	624,181	65,900	77,826	16,929	784,836
1954	500,199	56,971	61,233	16,953	635,356
1954:					
Mar.	43,136	5,177	6,300	1,447	56,060
Apr.	41,324	4,694	6,241	1,395	53,654
May	41,174	4,486	5,602	1,366	52,628
June	44,974	4,769	5,961	1,491	57,195
July	32,800	3,499	4,108	1,145	41,552
Aug.	32,396	4,647	3,569	1,439	42,051
Sept.	42,198	5,049	5,138	1,493	53,878
Oct.	47,063	4,931	4,711	1,604	58,309
Nov.	46,409	5,276	3,967	1,635	57,287
Dec.	52,329	5,202	4,502	1,476	63,509

Exports

1946	68,763	2,642	495	797	72,697
1947	7,951	2,617	62	755	11,385
1948	1,093	2,875	21	885	4,874
1949	1,401	3,330	178	1,574	6,483
1950	900	4,826	31	1,895	7,652
1951	483	6,825	216	1,725	9,249
1952	9,467	9,813	126	2,695	22,101
1953	7,692	11,494	237	3,245	22,668
1954	11,047	12,165	3,073	4,201	30,486
1954:					
Mar.	1,265	930	416	288	2,899
Apr.	520	1,296	62	454	2,332
May	1,115	844	373	395	2,727
June	881	694	216	215	2,006
July	1,126	1,220	421	358	3,125
Aug.	1,314	945	384	307	2,950
Sept.	785	978	53	270	2,086
Oct.	1,284	1,301	189	455	3,229
Nov.	659	1,081	575	433	2,748
Dec.	972	1,191	382	444	2,989

Stocks

1946	81,486	10,470	19,478	3,755	115,186
1947	40,606	5,237	13,184	3,339	62,366
1948	96,282	5,072	10,995	2,762	115,111
1949	77,731	4,654	12,224	3,433	98,042
1950	36,947	5,733	7,243	2,840	52,758
1951	105,271	8,379	12,481	3,821	129,912
1952	83,861	8,535	22,716	3,875	118,987
1953	135,153	11,480	24,866	4,346	175,845
1954	115,426	11,587	19,136	4,149	150,298
1954:					
Mar.	145,178	12,575	22,329	4,202	184,284
Apr.	136,446	12,665	21,673	4,199	174,983
May	131,604	11,467	20,077	4,435	167,583
June	124,678	10,646	17,534	4,314	157,172
July	128,752	11,315	18,150	4,727	162,944
Aug.	135,164	10,710	19,672	4,613	170,159
Sept.	128,313	10,288	18,513	4,548	161,662
Oct.	127,204	11,038	18,653	4,272	161,167
Nov.	121,772	11,429	19,338	4,366	156,905
Dec.	115,426	11,587	19,136	4,149	150,298

Source: U. S. Department of Commerce.

Natural and Synthetic Rubber Latex in the United States

(All Quantities in Long Tons)

New Supply

Year	Natural	GR-S	Neoprene	N-Type	Total Synthetic	Grand Total
1943	1,890	194	1,512	.....	1,706	3,596
1944	3,090	6,580	4,683	.....	11,263	14,353
1945	4,768	15,176	7,077	.....	22,253	27,021
1946	8,012	24,810	13,595	.....	38,405	46,417
1947	17,675	22,474	6,089	.....	28,563	46,238
1948	32,630	21,494	5,022	.....	26,516	59,146
1949	29,974	21,357	3,651	.....	25,008	54,982
1950	54,401	31,339	5,725	.....	37,064	91,465
1951	54,963	32,972	6,866	2,948	42,786	97,749
1952	48,228	42,273	7,598	4,164	54,035	102,263
1953	75,511	48,112	9,026	5,844	62,982	138,493
1954	65,650	48,379	8,214	6,866	63,459	129,109
1953:						
Dec.	7,168	3,900	636	490	5,026	17,220
1954:						
Jan.	5,396	4,089	592	471	5,152	10,548
Feb.	5,681	3,928	742	375	5,045	10,726
Mar.	5,682	4,142	709	483	5,324	11,006
Apr.	5,663	4,046	803	461	5,310	10,973
May	3,806	3,838	680	623	5,141	8,947
June	6,590	4,019	620	585	5,224	11,814
July	5,236	2,589	448	643	3,680	8,916
Aug.	7,571	1,995	756	682	3,433	11,004
Sept.	6,480	4,190	676	581	5,447	11,927
Oct.	7,210	5,190	742	780	6,712	13,922
Nov.	6,335	5,115	717	558	6,390	12,725
Dec.	.....	5,238	729	624	6,591	.....

Consumption[1]

1943	9,578	150	1,400	....	1,550	11,128
1944	6,085	6,000	4,400	....	10,400	16,485
1945	3,886	14,500	6,800	....	21,300	25,186
1946	5,714	23,500	13,000	....	36,500	42,214
1947	13,909	22,500	6,500	....	29,000	42,909
1948	28,489	21,500	5,250	....	26,750	55,239
1949	36,117	21,500	3,750	....	25,250	61,367
1950	56,138	31,000	5,500	....	36,500	92,638
1951	46,750	31,031	6,279	2,628	39,938	86,688
1952	53,567	40,562	7,368	3,093	51,023	104,590
1953	67,375	46,473	7,981	3,654	58,108	125,483
1954	75,420	44,184	7,166	4,177	55,527	130,947
1953:						
Dec.	5,395	3,475	574	277	4,344	9,739
1954:						
Jan.	5,882	3,475	615	275	4,365	10,247
Feb.	5,595	3,568	575	250	4,393	9,988
Mar.	6,610	3,982	729	335	5,046	11,656
Apr.	5,892	3,748	603	324	4,675	10,567
May	5,969	3,394	586	348	4,328	10,297
June	5,884	3,653	629	402	4,684	10,568
July	4,298	2,587	482	296	3,365	7,663
Aug.	5,228	2,834	561	351	3,746	8,974
Sept.	6,903	3,599	628	379	4,606	11,509
Oct.	7,527	4,347	612	376	5,335	12,862
Nov.	7,622	4,411	631	411	5,453	13,075
Dec.	8,010	4,586	515	430	5,531	13,541

Stocks at End of Period

1943	5,638	....	....	....	....	5,638
1944	2,443	....	....	....	....	2,443
1945	3,121	....	....	....	....	3,121
1946	4,865	....	....	....	....	4,865
1947	5,033	....	....	....	....	5,033
1948	11,235	....	....	....	....	11,235
1949	5,063	....	....	....	....	5,063
1950	4,927	....	....	....	....	4,927
1951	4,752	3,727	1,245	532	5,504	10,256
1952	6,201	5,040	1,019	902	6,961	13,162
1953	13,532	4,794	1,117	721	6,632	20,164
1954	10,158	5,354	1,110	818	7,282	17,440
1953:						
Dec.	13,532	4,794	1,117	721	6,632	20,164
1954:						
Jan.	12,375	5,001	1,019	703	6,723	19,098
Feb.	12,963	5,269	963	625	6,857	19,820
Mar.	11,870	5,247	975	588	6,810	18,680
Apr.	10,803	5,273	1,062	600	6,935	17,738
May	8,907	5,180	1,110	655	6,945	15,852
June	9,460	5,591	1,020	646	7,257	16,717
July	10,171	5,363	1,004	831	7,198	17,369
Aug.	12,009	4,220	1,019	993	6,232	18,241
Sept.	11,546	4,504	984	908	6,396	17,942
Oct.	10,952	4,745	1,001	950	6,696	17,648
Nov.	9,759	4,943	1,055	939	6,937	16,696
Dec.	10,158	5,354	1,110	818	7,282	17,440

Source: U. S. Department of Commerce.
Note: (1) GR-S and Neoprene consumption estimated through 1950.

You make them

We road test them

On the most natural Proving Grounds in America—South Texas

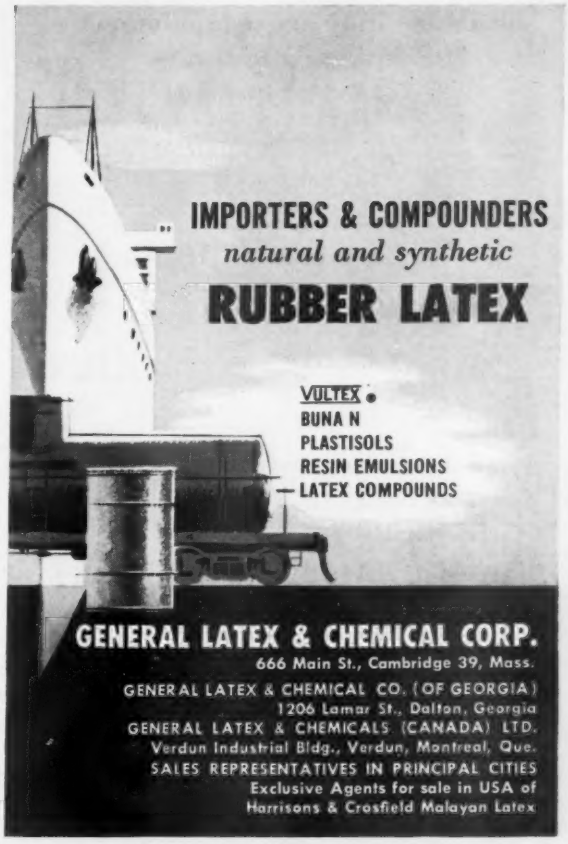
This independent test fleet is located in Devine, Texas, some thirty-two miles southwest of San Antonio on U S Hiway 81. Sponsors have a choice of three routes from which to choose. Test procedures are flexible. Tire rotation, cycle miles, number and frequency of reports or routing, can be a basis for discussion if the sponsor so desires. We endeavor to operate to the best advantage of the sponsor. Because we are wholly independent of any organization, all information collected is responsible to the sponsor only.

Tires of all specifications tested—both passenger car and truck. Your inquiries will receive prompt attention.

SOUTH TEXAS TIRE TEST FLEET

Phone 301 DEVINE, TEXAS P. O. Box 95

A. J. (AL) Morrow, Owner-Manager



IMPORTERS & COMPOUNDERS

natural and synthetic

RUBBER LATEX

VULTEX •
BUNA N
PLASTISOLS
RESIN EMULSIONS
— LATEX COMPOUNDS

GENERAL LATEX & CHEMICAL CORP.

666 Main St., Cambridge 39, Mass.

GENERAL LATEX & CHEMICAL CO. (OF GEORGIA)
1206 Lamar St., Dalton, Georgia

GENERAL LATEX & CHEMICALS (CANADA) LTD.
Verdun Industrial Bldg., Verdun, Montreal, Que.

SALES REPRESENTATIVES IN PRINCIPAL CITIES
Exclusive Agents for sale in USA of
Harrisons & Crosfield Malayan Latex

THE SEAL OF DEPENDABILITY

Our products are engineered to fill every need in natural and synthetic rubber compounding wherever the use of vulcanized oil is indicated.

We point with pride not only to a complete line of solid Brown, White, "Neophax" and "Amberex" grades, but also to our hydrocarbon solutions of "Factice" for use in their appropriate compounds.

Continuing research and development in our laboratory and rigid production control has made us the leader in this field.

The services of our laboratory are at your disposal in solving your compounding problems.

Oldest and Largest Manufacturers of "Factice" Brand Vulcanized Oil Since 1900

(Reg. U.S. Pat. Off.)

THE STAMFORD RUBBER SUPPLY COMPANY

Stamford, Conn.

Rubber Industry Employment Earnings and Hours

All Rubber Products

Mo.	1953 Production Workers (thousands)	1953 Average Weekly Earnings	1953 Average Weekly Hours	1953 Average Hourly Earnings	1954 Production Workers (thousands)	1954 Average Weekly Earnings	1954 Average Weekly Hours	1954 Average Hourly Earnings
Jan.	219.2	$78.09	41.1	$1.90	205.7	75.08	38.7	1.94
Feb.	219.2	79.30	41.3	1.92	202.9	75.47	38.9	1.94
Mar.	220.5	80.29	41.6	1.93	199.4	74.31	38.5	1.93
Apr.	226.3	79.32	41.1	1.93	195.2	75.08	38.7	1.94
May	226.2	78.59	40.3	1.95	197.0	77.81	39.7	1.96
June	226.5	78.55	40.7	1.93	198.4	79.60	40.2	1.98
July	219.3	78.98	40.5	1.95	173.1	76.83	39.4	1.95
Aug.	220.7	77.21	39.8	1.94	177.0	76.25	39.1	1.95
Sept.	220.6	74.88	39.0	1.92	198.9	77.81	39.3	1.98
Oct.	215.6	75.07	39.1	1.92	205.1	81.41	40.3	2.02
Nov.	210.0	75.65	39.4	1.92	208.2	....	....	....
Dec.	208.7	75.66	39.2	1.93	....	....	....	....
Tires and Tubes								
Jan.	91.5	89.24	40.2	2.22	86.4	82.88	37.5	2.21
Feb.	91.2	91.80	40.8	2.25	85.3	83.03	37.4	2.22
Mar.	91.6	93.83	41.7	2.25	84.7	80.89	36.6	2.21
Apr.	95.6	91.58	40.7	2.25	83.2	84.14	37.9	2.22
May	96.2	91.30	40.4	2.26	83.9	88.65	39.4	2.25
June	96.0	89.20	40.0	2.23	85.0	92.06	40.2	2.29
July	93.7	90.45	40.2	2.25	67.3	87.01	38.5	2.26
Aug.	93.3	87.58	39.1	2.24	68.0	85.65	37.4	2.29
Sept.	93.4	83.54	37.8	2.21	85.2	86.18	38.3	2.25
Oct.	90.3	83.16	37.8	2.20	86.5	90.71	39.1	2.32
Nov.	87.3	85.09	38.5	2.21	....	....	....	....
Dec.	86.7	82.43	37.3	2.21	....	....	....	....
Rubber Footwear								
Jan.	24.5	64.96	40.1	1.62	21.5	62.98	38.4	1.64
Feb.	24.2	67.57	41.2	1.64	20.5	65.57	39.5	1.66
Mar.	24.2	67.57	41.2	1.64	19.6	65.51	39.7	1.65
Apr.	23.8	67.82	41.1	1.65	19.2	63.58	38.3	1.66
May	23.3	60.31	37.0	1.63	19.8	65.46	39.2	1.67
June	23.5	68.06	41.0	1.66	19.8	67.30	40.3	1.67
July	22.5	68.64	41.1	1.67	20.1	68.45	40.5	1.69
Aug.	23.6	65.53	40.2	1.63	20.5	66.40	40.0	1.66
Sept.	24.1	64.24	39.9	1.61	21.0	66.08	39.1	1.69
Oct.	24.0	62.86	38.8	1.62	21.9	71.34	41.0	1.74
Nov.	23.7	63.57	39.0	1.63	....	....	....	....
Dec.	22.9	65.44	39.9	1.64	....	....	....	....
All Other Rubber Products								
Jan.	103.2	71.74	42.2	1.70	97.8	70.62	39.9	1.77
Feb.	103.8	71.06	41.8	1.70	97.1	70.40	40.0	1.76
Mar.	104.7	71.72	41.7	1.72	95.1	70.22	39.9	1.76
Apr.	106.9	71.21	41.4	1.72	92.8	69.30	39.6	1.75
May	106.7	70.93	41.0	1.73	93.3	70.98	40.1	1.77
June	107.0	71.28	41.2	1.73	93.6	70.98	40.1	1.77
July	103.1	70.64	40.6	1.74	85.7	70.62	39.9	1.77
Aug.	103.8	70.30	40.4	1.74	88.5	71.15	40.2	1.77
Sept.	103.1	69.65	39.8	1.75	92.7	72.36	40.2	1.80
Oct.	101.3	70.70	40.4	1.75	96.7	75.17	41.3	1.82
Nov.	99.0	70.53	40.3	1.75	....	....	....	....
Dec.	99.1	72.45	40.7	1.78	....	....	....	....

Source: U. S. Department of Labor.

Note: Data are based upon reports from cooperating establishments covering both full and part-time employees who work during, or received pay for, any part of the pay period ending nearest the 15th of the month. These employment series have been adjusted to first quarter 1951 benchmark levels indicated by data from government social insurance programs. Hours and earnings data pertain only to production and related workers.

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market—in Cents)

Average Monthly Price Per Pound

	1948	1949	1950	1951	1952	1953	1954	1955
Jan.	36.09	33.37	31.89	45.04	42.96	33.24	34.15	35.07
Feb.	33.63	33.41	32.79	(a)	41.64	33.76	35.00	35.04
Mar.	35.04	33.44	32.65	46.06	41.70	34.10	35.23	....
Apr.	38.10	33.84	33.23	46.06	41.79	33.85	35.22	....
May	38.57	33.73	33.64	46.06	39.98	34.30	35.34	....
June	38.12	33.56	34.61	46.06	41.31	34.11	35.17	....
July	34.89	32.99	38.11	46.21	40.37	34.20	35.37	....
Aug.	32.23	32.06	38.93	35.93	40.42	33.82	35.19	....
Sept.	31.92	30.94	41.62	36.20	39.75	33.69	35.46	....
Oct.	32.01	30.32	40.66	38.13	37.52	33.53	35.24	....
Nov.	32.15	30.52	43.11	42.70	35.59	33.60	34.80	....
Dec.	32.90	31.08	43.37	43.32	33.76	33.52	35.03	....
Average for Year	34.64	32.44	37.05	42.43	39.71	33.81	35.10	....

Note: The Government established a ceiling price of 43.76c for spot cotton on March 3, 1951. (a) Trading suspended during February.

Production Index for the Rubber Industry

(1947-1949 = 100)

(Based on man-hours)

	1952	1953	1954		1952	1953	1954
Jan.	116	132	114	July	92	114	85
Feb.	119	140	114	Aug.	109	122	94
Mar.	120	143	118	Sept.	118	122	118
Apr.	114	140	116	Oct.	131	127	131
May	111	137	118	Nov.	129	120	124
June	115	131	121	Dec.	123	111	....

Sales by the Rubber Industry

(in Millions of Dollars*)

	1952	1953	1954		1952	1953	1954
Jan.	408	424	348	July	377	448	374
Feb.	402	435	351	Aug.	388	409	337
Mar.	400	473	388	Sept.	427	416	334
Apr.	407	444	375	Oct.	423	395	332
May	402	422	357	Nov.	383	346	388
June	409	436	377	Dec.	418	369	....

Rubber Manufacturers' Inventories

(in Millions of Dollars*)

	1952	1953	1954		1952	1953	1954
Jan.	809	866	844	July	890	925	784
Feb.	842	868	857	Aug.	877	897	761
Mar.	857	880	849	Sept.	871	908	804
Apr.	850	874	812	Oct.	866	881	838
May	855	888	810	Nov.	850	867	819
June	851	914	829	Dec.	877	868	....

Source: U. S. Department of Commerce.
Notes: * Adjusted for seasonal variation.

No. 1 R.S.S.—Annual Average Prices

(New York Market—Cents per Pound)

Year	High	Low	Avg.	Year	High	Low	Avg.
1913	113	59	82.04	1934	15⅞	8¼	12.92
1914	93	56	65.33	1935	13¾	10½	12.37
1915	79	58½	65.85	1936	23	13½	16.41
1916	102	55	72.50	1937	26⅞	14	19.39
1917	90	52	72.23	1938	17⅞	10¼	14.64
1918	70	40	60.15	1939	24	14⅛	17.57
1919	57	38½	48.70	1940	24	18¼	20.10
1920	56½	16	36.30	1941	24⅞	19⅛	22.40
1921	21¼	11½	16.36	1942	22½	22½	22.50
1922	28⅜	13⅜	17.50	1943	22½	22½	22.50
1923	37⅛	24¾	29.45	1944	22½	22½	22.50
1924	40⅛	17⅜	26.20	1945	22½	22½	22.50
1925	121	34⅜	72.46	1946	22½	22½	22.50
1926	88½	36¼	48.50	1947	25	14	20.00
1927	41¾	33	37.72	1948	25	18	21.99
1928	41¼	17	22.48	1949	19¾	15⅞	17.57
1929	26⅞	15½	20.55	1950	86	18	41.10
1930	16½	7½	11.98	1951	76	52	(a)
1931	8⅝	4¼	6.17	1952*	33	26½	29.15
1932	4¾	2½	3.49	1953	31⅞	19⅞	24.21
1933	9⅞	2⅞	5.96	1954	34½	19½	23.61

Note: Price was fixed by Government on August 6, 1941, at 22½c a pound for non-war uses. Free trading was resumed May 1, 1947. (a) Free trading suspended March 31, 1951. GSA selling price ranged between 52 and 66c during balance of year. * Free trading was resumed on July 1, 1952; figures represent only July through December, 1952.

No. 1 R.S.S.—Monthly Average Prices

(New York Market—Cents per pound)

	1948	1949	1950	1951	1952	1953	1954	1955
Jan.	21.83	19.23	18.33	71.21	....	29.40	20.22	33.92
Feb.	20.42	18.49	19.40	73.61	....	27.57	19.98	34.90
Mar.	20.33	19.08	19.86	72.05	....	26.59	20.16	....
Apr.	22.87	18.53	23.51	....	....	24.66	22.06	....
May	23.39	17.92	28.07	....	....	25.52	21.96	....
June	22.80	16.36	30.92	....	....	24.42	23.01	....
July	24.24	16.45	39.10	....	30.52	23.64	24.12	....
Aug.	23.63	16.60	51.63	....	29.36	23.36	23.26	....
Sept.	22.81	17.58	55.98	....	27.42	23.06	23.99	....
Oct.	22.13	16.31	62.19	....	27.26	20.82	26.57	....
Nov.	20.52	16.70	74.05	....	29.25	20.58	28.07	....
Dec.	18.86	17.53	71.20	....	31.26	20.92	29.88	....
Average for Year	21.99	17.57	41.10	(a)	29.15	24.21	23.61	....

Note: (a) Free trading suspended March 31, 1951, and resumed on July 1, 1952.

taking a tip from Stamp Collecting We Offer You

Rubber Compounds "On Approval"

You submit your problem. We will submit a laboratory batch "on approval", including cost estimate and processing procedure, for purchase. If not the answer to your problem but promise is shown, we will undertake the requisite development on a job or retainer basis.

BACKGROUND: From a modest start over thirty-five years ago Foster D. Snell has grown into a million dollar research organization with a staff of over 125 scientists and supporting personnel.

OUR RUBBER and Plastics Department is equipped with all standard rubber processing machinery and apparatus for low temperature, ozone, physical, chemical and many other tests.

ALL INQUIRIES

are without cost or obligation. Our Booklet "Elastomers and Plastomers" is available on request. We shall be pleased to hear from you.

RESEARCH LABORATORIES
FOSTER D. SNELL INC.
29 WEST 15th ST. NEW YORK 11, N.Y. — WA 4-8800
CHEMISTS · ENGINEERS

NATURAL LATEX

Centrifuge
Cream

REGULAR AND LOW AMMONIA

BULK — DRUMS

FOR HALF A CENTURY WE HAVE BEEN SUPPLYING CRUDE RUBBER TO THE

AMERICAN RUBBER INDUSTRY

LITTLEJOHN & CO., INC.

120 Wall Street New York 5, N. Y.
Telephone — WHitehall 3-2400

FOR EXTRUDERS, PLASTICIZERS, STRAINERS, TUBERS

Only *Xaloy* Liners

MEET ALL OF THE PROBLEMS OF THE RUBBER— PLASTICS INDUSTRIES

PROOF—

Abrasion Resisting Xaloy Cylinder Liners are supplied as standard original and replacement parts by extruder equipment manufacturers

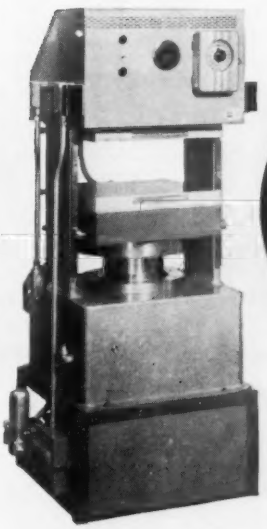
Only XALOY Cylinder Liners assure—

- Absolute maximum service life
- Fast, easy liner replacement
- Exceptional and uniform hardness
- Highly polished liner surface

write for engineering and production data book

Xaloy
INDUSTRIAL RESEARCH LABORATORIES
Division of Honolulu Oil Corporation
961 E. Slauson Ave., Los Angeles 11, California

The **P·H·I** *Automatic 70 Ton Hydraulic Press*



ELECTRIC
Hydraulic System, Cycle Timer, Heated Platens and Temperature controls

18"x 18" Platens to 600° with thermoswitch controls.
Two position ram gives 8"& 12" Daylight.
8" stroke with down stroke trip.

larger presses built to customers specifications

P·H·I
PRESS

Write for Circular
PASADENA HYDRAULICS INC.
279 N. Hill Avenue
Pasadena 4, California

Automotive Pneumatic Casings

(Thousands of Units)

	Shipments					
	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1945 (total)	5,984	36,479	504	42,967	44,524	3,077
Passenger Car.	1,115	25,463	222	26,800	28,200	2,214
Truck and Bus	4,869	11,016	282	16,167	16,324	863
1946 (total)	15,310	65,490	1,512	82,312	82,298	2,448
Passenger Car.	11,086	54,684	653	66,423	66,466	1,763
Truck and Bus	4,224	10,806	859	15,889	15,832	685
1947 (total)	25,056	62,871	3,256	91,183	95,550	6,949
Passenger Car.	19,644	52,857	1,608	74,109	77,795	5,444
Truck and Bus	5,412	10,014	1,648	17,074	17,755	1,505
1948 (total)	26,845	49,148	1,787	77,781	81,314	10,698
Passenger Car.	21,589	41,295	656	63,540	66,738	8,773
Truck and Bus	5,256	7,853	1,132	14,241	14,576	1,925
1949 (total)	31,584	43,466	1,467	76,517	76,369	10,638
Passenger Car.	28,129	36,440	509	65,077	65,140	8,904
Truck and Bus	3,456	7,026	958	11,440	11,228	1,734
1950 (total)	41,349	56,808	1,430	99,587	92,754	3,794
Passenger Car.	36,678	47,103	642	84,423	78,598	3,050
Truck and Bus	4,671	9,705	788	15,164	14,156	743
1951 (total)	32,153	44,612	1,677	78,442	83,405	8,765
Passenger Car.	26,729	34,226	723	61,678	65,546	6,973
Truck and Bus	5,424	10,386	954	16,764	17,859	1,791
1952 (total)	29,484	54,342	1,520	85,346	90,411	14,110
Passenger Car.	24,106	45,458	741	70,305	74,341	11,251
Truck and Bus	5,378	8,884	779	15,041	16,070	2,859
1953 (total)	37,949	55,124	1,543	94,617	96,150	15,720
Passenger Car.	33,106	45,798	809	79,713	81,455	13,044
Truck and Bus	4,843	9,326	734	14,904	14,696	2,676
1954 (total)	33,338	55,174	1,753	90,268	89,153	14,774
Passenger Car.	29,746	47,053	929	77,729	76,806	12,228
Truck and Bus	3,592	8,120	827	12,540	12,345	2,546
1954:						
Mar. (total)	3,163	4,350	116	7,629	7,981	16,077
Passenger Car.	2,809	3,753	45	6,607	6,878	13,112
Truck and Bus	354	597	71	1,022	1,103	2,966
Apr. (total)	3,131	4,935	176	8,243	8,065	15,906
Passenger Car.	2,785	4,328	95	7,208	7,031	12,955
Truck and Bus	346	607	81	1,035	1,034	2,951
May (total)	3,020	5,115	184	8,319	7,965	15,504
Passenger Car.	2,695	4,503	101	7,300	6,985	12,575
Truck and Bus	324	612	83	1,020	980	2,928
June (total)	2,890	6,029	160	9,079	8,796	15,218
Passenger Car.	2,587	5,326	89	8,002	7,755	12,323
Truck and Bus	303	703	71	1,076	1,041	2,895
July (total)	2,782	5,948	155	8,884	6,360	12,640
Passenger Car.	2,516	5,222	73	7,812	5,605	10,063
Truck and Bus	265	725	82	1,073	755	2,577
Aug. (total)	2,527	5,429	123	8,080	5,427	9,985
Passenger Car.	2,284	4,605	73	6,962	4,710	7,797
Truck and Bus	243	824	51	1,118	717	2,188
Sept. (total) ...	1,601	4,537	130	6,269	7,279	11,184
Passenger Car.	1,375	3,825	73	5,273	6,242	8,951
Truck and Bus	227	712	57	995	1,037	2,233
Oct. (total)	1,868	4,251	147	6,266	7,869	12,799
Passenger Car.	1,617	3,423	81	5,121	6,702	10,531
Truck and Bus	251	828	67	1,146	1,167	2,268
Nov. (total)	3,124	3,560	158	6,842	7,626	13,676
Passenger Car.	2,823	2,844	92	5,759	6,480	11,331
Truck and Bus	301	716	67	1,084	1,145	2,345
Dec. (total)	3,707	3,470	169	7,347	8,444	14,774
Passenger Car.	3,383	2,845	88	6,315	7,215	12,228
Truck and Bus	325	625	81	1,031	1,229	2,546

Source: The Rubber Manufacturers Association, Inc.

Automobile Production in U. S.

(Civilian Production Only)

Year	Passenger Cars	Trucks	Total	Year	Passenger Cars	Trucks	Total
1935	3,252,244	694,690	3,946,934	1945	83,792	313,643	397,435
1936	3,669,528	781,862	4,451,390	1946	2,148,699	930,760	3,079,459
1937	3,915,889	892,382	4,808,271	1947	3,558,178	1,220,634	4,778,812
1938	2,000,985	485,852	2,486,837	1948	3,909,270	1,363,856	5,273,126
1939	2,866,796	704,308	3,571,104	1949	5,108,841	1,123,736	6,232,577
1940	3,692,328	721,637	4,413,965	1950	6,665,836	1,332,263	7,998,099
1941	3,744,500	875,381	4,619,681	1951	5,337,729	1,420,432	6,758,161
1942	220,814	133,083	353,897	1952	4,320,794	1,212,790	5,533,584
1943	0	4,501	4,501	1953	6,121,787	1,202,196	7,323,983
1944	0	124,819	124,819	1954	5,558,897	1,038,045	6,596,942
1954:							
Jan.	454,562	96,167	550,729	July	451,663	78,507	530,170
Feb.	446,676	87,141	533,817	Aug.	445,306	75,835	521,141
Mar.	531,529	101,177	632,706	Sept.	300,998	68,618	369,616
Apr.	534,667	96,723	631,390	Oct.	221,195	66,138	287,160
May	497,062	91,226	588,288	Nov.	498,248	89,232	587,480
June	507,055	91,470	598,525	Dec.	669,936	95,811	765,747
1955:							
Jan.	636,242	89,676	725,918	July	.....	.....	.....
Feb.	.....	.....	.....	Aug.	.....	.....	.....
Mar.	.....	.....	.....	Sept.	.....	.....	.....
Apr.	.....	.....	.....	Oct.	.....	.....	.....
May	.....	.....	.....	Nov.	.....	.....	.....
June	.....	.....	.....	Dec.	.....	.....	.....

Source: Automobile Manufacturers Association.
Note: Figures are based on factory sales. Revisions are made from time to time in these figures and the latest issue should be consulted for accuracy.

Automotive Inner Tubes

(Thousands of Units)

	Shipments					
Year	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1945	5,988	33,906	411	40,304	41,742	3,627
1946	15,327	59,357	1,424	76,108	77,251	3,820
1947	25,046	46,560	2,483	74,088	79,181	8,059
1948	26,833	40,548	1,119	68,499	70,033	9,641
1949	31,521	31,450	887	63,858	65,114	10,657
1950	41,240	42,671	811	84,723	80,179	....
1951	32,151	32,284	1,071	65,507	67,249	10,094
1952	29,451	32,985	1,014	63,449	65,073	12,036
1953	37,957	36,072	878	74,907	74,425	11,874
1954	25,091	35,443	948	61,482	58,399	9,299
1954:						
Mar.	3,165	2,774	74	6,013	6,399	10,869
Apr.	3,134	2,770	97	6,001	6,266	11,234
May	3,017	2,900	84	6,002	5,909	11,170
June	2,889	3,657	85	6,631	5,739	10,379
July	2,707	3,471	87	6,265	4,132	8,429
Aug.	2,174	3,504	69	5,748	3,773	6,588
Sept.	1,130	2,839	64	4,034	4,490	7,179
Oct.	429	2,567	92	3,087	3,953	8,313
Nov.	450	2,142	90	2,681	3,246	8,706
Dec.	476	2,019	74	2,569	3,201	9,299

Source: The Rubber Manufacturers Association, Inc.

Vinyl and Vinyl Copolymer Resins—Sales

(Thousands of Pounds—Resin Content)

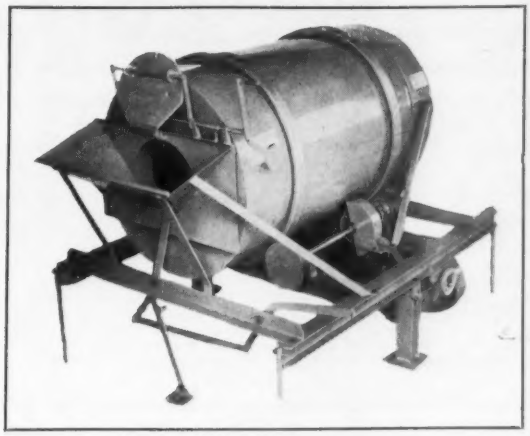
	Polyvinyl Chloride and Copolymer Resins							All Other Vinyl Resins		
	Film	Sheeting	Molding & Extrusion	Textile & Paper Treating	Flooring	Protective Coatings	All Other Uses	Adhesives	All Other Uses	Grand Total
1953	63,691	62,385	129,215	52,353	22,152	22,823	27,790	22,411	77,478	480,299
1953										
July	4,638	2,821	8,580	3,376	1,507	1,798	2,500	1,859	6,402	33,481
Aug.	4,903	4,609	8,650	3,851	2,063	1,850	2,412	1,721	6,121	36,180
Sept.	5,318	4,855	9 485	4,281	2,073	1,948	2,284	2,000	5,824	38,066
Oct.	5,568	5,081	16,219	4,542	2,279	1,707	2,941	2,049	7,118	41,505
Nov.	4,507	4,126	9,443	3,615	1,447	1,561	2,446	1,755	6,711	35,610
Dec.	4,965	4,579	12,469	4,024	1,549	1,789	3,456	1,721	7,123	41,676
1954										
Jan.	4,869	5,435	10,120	4,638	911	1,614	1,731	1,825	5,988	37,131
Feb.	5,170	5,720	10,711	4,346	1,170	1,829	2,407	2,038	6,712	40,103
Mar.	7,348	6,790	12,255	4,826	1,432	2,029	2,392	2,622	6,127	45,819
Apr.	6,457	6,455	12,568	4,479	1,894	1,864	2,311	2,407	6,325	44,700
May	4,775	3,840	11,096	3,582	3,256	1,730	2,643	2,578	6,010	39,510
June	5,100	3,003	10,529	3,552	3,554	1,916	2,744	2,500	5,343	38,241
July	5,114	3,441	9,648	3,105	3,356	1,859	2,598	1,951	5,010	36,082
Aug.	7,078	4,522	14,541	4,259	3,931	2,198	3,407	2,444	5,804	48,183
Sept.	5,665	4,340	13,454	3,784	3,797	2,242	3,779	2,379	5,768	45,208
Oct.	....	....	....	....	....	....	....	....	....	....
Nov.	....	....	....	....	....	....	....	....	....	....
Dec.	....	....	....	....	....	....	....	....	....	....

Source: Chemical Division, U. S. Tariff Commission.

WILLS "SUB-ZERO"

ROTARY TUMBLERS

THE INDUSTRY STANDARD



LIQUID CO_2

DEFLASHING RESULTS PROVE STARTLING.
MODELS NOW AVAILABLE TO USE EITHER
SOLID OR LIQUID CARBON DIOXIDE.

FERRY MACHINE COMPANY

WILLS RUBBER TRIMMING DIVISION

KENT, OHIO, U. S. A.

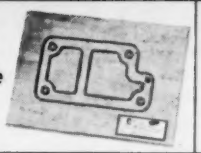
(Export Sales Through Binney & Smith, International)

RUBBER FABRICATORS NEED ACCURATE CUTTING DIES

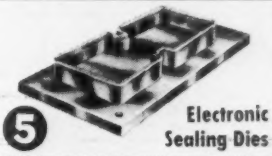
For Cutting
Rubber, Neoprene, Plastics, etc.
Sheeting, Foam, Sponge, Cellular,
Cured & Uncured
Gang Dies Our Specialty

3 Mallet Handle Dies

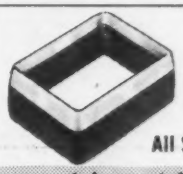
4 Steel Rule Cutting Dies



2 Steel Rule Clicker Dies



5 Electronic Sealing Dies



1 All Steel Dies

We can also die cut your materials on jobs you don't wish to handle yourself.

Dies for cutting gaskets, flashing from molded parts, rubber soles, foam and sponge for furniture padding, inflated toys, clothing and footwear, etc.

SAME DAY SERVICE

ACCURATE

STEEL RULE DIE MANUFACTURERS

24-28 W. 21 ST. • N. Y. 10, N. Y. • CHelsea 2-0860-1

Intelligent Service to Industry for Almost a Quarter Century

BOOKS for Technical Men

LATEX IN INDUSTRY by Royce J. Noble

PRICE: $15.00* (postpaid-U.S.)

RUBBER: NATURAL AND SYNTHETIC by H. J. Stern

PRICE: $12.00* (postpaid)

LATEX AND RUBBER DERIVATIVES—Vols. II & III by F. Marchionna

PRICE: $10.00* (postpaid)

ANNUAL BIBLIOGRAPHY OF RUBBER LITERATURE: 1946-1948 EDITION

PRICE: $7.50* (postpaid)

RECLAIMED RUBBER by John M. Ball

PRICE: $5.00* (postpaid-U.S.)

Available from RUBBER AGE

250 West 57th St., New York 19, N. Y.

** Add 3% for New York City Addresses*

Various Compounding Materials Consumed by the Rubber Industry

Material	1947	1948	1949	1950	1951	1952	1953
Antimony, Primary:							
Short tons	39	41	55	103[c]	19[c]	66	20
% of total	.002	.003	.005	.007	.001	.004	.001
Asphalt: [a]							
Short tons	32,113	19,967	18,050	26,819	21,414	33,288	.....
% of total	0.7	0.4	0.3	0.3	0.3	0.4	.....
Barite (Barytes):							
Short tons	17,000	18,000	14,000	19,000	15,000	14,000	.....
% of total	3.1	2.85	2.53	3.31	2.13	2.0	.....
Carbon Black:							
Short tons	471,790	435,282	383,565	515,184	530,614	537,273	566,797
% of total	94.3	95.5	93.3	92.9	93.9	93.1	94.4
Clay, Kaolin:							
Short tons	166,201	176,965	197,341	263,306	231,331	240,982	.....
% of total	11.5	11.3	13.1	15.0	12.7	13.2	.....
Clay, Fire & Stoneware:							
Short tons	17,970	15,480	27,148	9,500	.....	9,322	.....
% of total	0.2	0.2	0.3	0.1	.....	0.1	.....
Lime:							
Short tons	589	1,154	715	908	1,126	2,000	.....
% of total	0.01	0.02	.0002	.0002	[d]	[d]	.....
Litharge:							
Short tons	2,205	2,835	1,398	3,047	2,641	2,109	.....
% of total	1.3	1.8	1.2	1.7	1.7	1.5	.....
Lithopone:							
Short tons	3,085	4,192	3,245	4,092	3,295	1,523	1,723
% of total	1.9	3.0	4.1	3.9	3.2	2.5	3.3
Mica, Ground:							
Short tons	3,900	4,372	3,856	5,776	6,551	5,126	.....
% of total	6.0	7.0	7.0	8.0	9.0	7.0	.....
Sulfur:							
Short tons	72,800	70,560	59,360	75,000	75,000	75,000	.....
% of total	1.8	1.7	1.5	1.3	1.6	1.6	.....
Talc: [b]							
Short tons	71,840	66,226	53,400	75,900	70,970	64,476	.....
% of total	13.9	13.0	12.0	12.0	11.2	10.9	.....
Zinc Oxide:							
Short tons	82,248	82,895	58,496	82,944	71,507	72,774	78,439
% of total	51.2	54.9	52.5	51.6	48.4	51.2	52.7

Source: U. S. Bureau of Mines.
Notes: ([a]) Solid and semi-solid products of less than 200 penetration. ([b]) Includes prophyllite and ground soapstone. ([c]) Does not include precipitated antimony sulfide as in previous years. ([d]) Negligible.

Reclaimed Rubber

(Including Natural and Synthetic)

(All Quantities in Long Tons)

Year	New Supply	Consumption—Tons	Consumption—% to Crude [a]	Exports	Stocks On Hand at End of Period
1938	122,400	120,800	27.6	7,403	23,000
1939	186,000	170,000	28.7	12,611	25,250
1940	208,971	190,244	29.3	11,347	32,636
1941	274,202	251,231	32.2	13,851	41,750
1942	286,007 [b]	254,820	64.6	30,405	42,532
1943	304,058 [c]	291,082	59.6	15,678	46,201
1944	260,631 [d]	251,083	35.3	11,800	43,832
1945	243,309	241,036	30.2	13,413	28,155
1946	295,612	275,410	26.5	14,461	33,666
1947	291,395	288,395	24.8	14,556	35,943
1948	266,861	261,113	24.4	11,428	32,630
1949	224,029	226,679	22.5	10,637	28,263
1950	314,008	303,733	24.1	11,740	35,708
1951	366,700	346,121	26.6	14,722	45,082
1952	274,981	280,002	22.2	11,180	30,664
1953	298,336	285,050	21.3	11,597	32,319
1954	257,869	248,778	20.2	10,251	31,199
1954:					
Jan.	20,026	19,114	19.7	912	31,865
Feb.	21,122	19,461	20.3	941	32,393
Mar.	23,383	22,882	20.8	830	32,148
Apr.	21,658	21,883	20.8	1,050	31,359
May	21,316	20,536	19.7	1,071	31,105
June	22,342	22,321	20.0	1,068	30,845
July	18,041	16,301	20.5	586	31,304
Aug.	15,519	17,660	22.0	647	27,692
Sept.	22,352	19,926	18.8	641	29,632
Oct.	23,566	22,098	19.3	808	30,395
Nov.	22,915	22,321	20.2	862	29,451
Dec.	25,629	24,275	20.4	835	31,199

Source: U. S. Department of Commerce.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. ([a]) Includes natural and synthetic rubber. ([b]) Includes 893 tons of imports. ([c]) Includes 67 tons of imports. ([d]) Includes 21 tons of imports.

Cotton, Rayon and Nylon Tire Fabrics

(Production in Thousands of Pounds)

	Cotton: Tire Cord Not Woven	Cotton: Cord Fabric Woven	Cotton: Chafer and All Other Tire Fabrics	Cotton: Total	Rayon and Nylon[b]: Tire Cord not Woven	Rayon and Nylon[b]: Tire Cord and Other Tire Fabrics	Rayon and Nylon[b]: Total
1952:							
Jan.-Mar.	11,226	36,378	12,971	60,575	14,434	72,249	86,683
Apr.-June	4,661	24,612	10,742	40,015	16,874	81,249	98,123
July-Sept.	335	9,257	9,460	19,052	18,128	80,355	98,483
Oct.-Dec.	*c*	4,728*a*	11,580	16,308	19,436	81,171	100,607
Total*	15,887	74,834	48,280	139,001	68,873	323,106	391,979
1953:							
Jan.-Mar.	*c*	4,378*a*	15,477	19,855	20,487	91,742	112,229
Apr.-June	*c*	5,713*a*	15,880	21,593	18,906	95,711	114,617
July-Sept.	*c*	3,562*a*	13,193	16,755	18,597	89,821	108,418
Oct.-Dec.	*c*	2,460	11,569	14,029	19,664	79,259	98,293
Total*	*c*	16,113	57,103	73,216	77,654	370,137	447,791
1954:							
Jan.-Mar.	*c*	2,585	13,229	15,814	17,297	78,388	95,685
Apr.-June	*c*	4,067	12,830	16,897	12,436	75,153	87,589
July-Sept.	.....	.....	.....	.....	.....	.....	.....
Oct.-Dec.	.....	.....	.....	.....	.....	.....	.....
Total	.....	.....	.....	.....	.....	.....	.....

Source: Bureau of the Census, U. S. Department of Commerce.
Notes: (a) Included with tire cord and fabrics to avoid disclosures of operations of individual mills. (b) Fuel cell fabrics are not included with rayon and nylon tire cord and fabrics. (c) Included with tire cord woven. (d) Included with chafer and all other tire fabrics. * Revised.

Gasoline Consumption

(In Thousands of Barrels of 42 Gallons)

	1947	1948	1949	1950	1951	1952	1953	1954
Jan.	57,057	61,308	63,125	66,981	80,670	86,863	89,634	89,852
Feb.	50,551	56,487	57,980	53,274	72,864	82,043	86,458	86,206
Mar.	59,947	68,171	73,282	78,780	86,962	87,065	98,158	101,549
Apr.	64,140	72,183	75,318	80,350	87,573	98,653	102,044	103,866
May	70,865	77,186	81,665	89,035	100,266	101,137	105,918	104,418
June	71,329	78,044	83,374	90,174	96,364	99,305	114,703	113,037
July	73,441	81,428	83,129	91,677	100,567	105,307	112,960	112,231
Aug.	72,089	80,351	84,707	94,507	101,453	102,954	109,124	110,223
Sept.	71,384	76,159	80,832	86,725	91,891	100,095	106,158	104,706
Oct.	73,277	75,164	79,327	89,067	100,209	103,689	106,037	105,607
Nov.	64,158	72,560	76,346	82,688	88,581	91,326	99,210	102,393
Dec.	67,506	72,162	75,628	81,032	84,551	95,817	100,225	.....
Total	795,015	871,270	913,713	994,290	1,091,951	1,154,254	1,230,629	.....

Source: U. S. Bureau of Mines.

Rim Production

	1950	1951	1952	1953	1954
Passenger Car	35,096,404	29,145,367	24,936,844	31,318,461	25,952,322
Truck & Bus	6,625,129	6,877,419	5,752,674	5,228,321	4,463,689
Agricultural	2,853,483	3,019,581	2,073,116	1,943,487	1,297,040
Earth Mover	15,602	28,026	31,791	24,685	21,536
Total	44,590,618	39,070,393	32,794,425	38,514,954	31,734,587

	1954: Aug.	Sept.	Oct.	Nov.	Dec.	1955: Jan.
Passenger Car	1,742,770	1,532,839	1,769,718	2,367,206	3,187,971	3,341,979
Truck & Bus	204,131	399,819	389,479	390,674	426,620	456,169
Agricultural	67,963	82,856	86,196	100,364	118,336	162,480
Earth Mover	323	2,204	1,592	2,013	2,377	2,663
Total	2,015,187	2,017,718	2,246,985	2,860,257	3,735,304	3,963,291

Source: The Tire & Rim Association, Inc.

Gaps in Your Technical Library?

For complete service on *any* book* on rubber, place your order with the

Book Department

RUBBER AGE

250 West 57th St., New York 19, N. Y.

** a listing of available books on rubber will be furnished on request.*

CLASSIFIED WANT ADS

RATES:

All Classifications (except Positions Wanted):
12c per word in light face type—Minimum, $5.00
18c per word in bold face type—Minimum, $5.00

Positions Wanted: (Light face type only)
$1.00 for 25 words or less; extra words, 5c each.

When Box Number is used, add 5 words to word count

Heading on separate line, $1.20 in light face; $1.80 in bold face.

Advertisements in borders: $20.00 per column inch; maximum, 85 words per inch.

All Classified Advertising must be paid in advance except for advertisers on contract. Send check with copy.

Replies to keyed advertisements will be forwarded to advertiser without charge.

Address all replies to Box Numbers care of RUBBER AGE, 250 West 57th Street, New York 19, N. Y.

Copy for April, 1955, issue must be received by Thursday, March 31st.

POSITIONS WANTED

PRODUCTION—DEVELOPMENT ENGINEER, available. Broad technical-practical knowledge of mechanical rubbers, sponge products and plastics. Cost minded, planner of low cost production, departmental efficiency, etc. Address Box 348-P, RUBBER AGE.

CHEMIST—compounder and formulator. Extensive experience in tires, paints, coatings. Proven ability. Desires change with definite responsibilities and future. Address Box 298-P, RUBBER AGE.

RUBBER AND PLASTIC TECHNOLOGIST—chemical engineer with varied experience in latices, dispersions, plastisols, rubber and plastics. Broad background in technical development, engineering, production, labor relations and costs. Specialties include latex products, wire and cable, rubber thread, dipped goods, coated fabrics, plastic sponge, dielectrics and tape. Presently employed. Desires position with progressive organization. Address Box 314-P, RUBBER AGE.

EXTRUDED LATEX THREAD TECHNOLOGIST desires to set up and/or manage thread plant for an aggressive organization. Chemical engineer with expert knowledge in every phase of this field. Inventor of numerous patents. Ten years experience in management. Can guarantee positive results with high quality and low operating costs. Excellent references. Desirous of investment participation. Address Box 324-P, RUBBER AGE.

PLANT MANAGER and PROCESSING ENGINEERS—molded, foam rubber, and latex dipped goods. Available on two weeks notice. Address Box 329-P, RUBBER AGE.

PROCESSING ENGINEER, for latex, foam, and latex dipping. Twelve years experience. Resume by request. Address Box 332-P, RUBBER AGE.

TECHNICAL SALES—excellent background in both latex and dry rubber compounding. Some sales experience on management level. Desires to locate in Southern California. Address Box 334-P, RUBBER AGE.

PRODUCTION—DEVELOPMENT MANAGER. 18 years of practical and technical experience in all phases of molded and lathe cut work. Wish to relocate and will furnish references. Address Box 337-P, RUBBER AGE.

MANUFACTURING EXECUTIVE, rubber technologist, 15 years in factory management, supervision of engineering, production, personnel, quality control, cost reduction, product development. Southern California location. $12,000-$15,000 range. Address Box 339-P, RUBBER AGE.

RUBBER and PLASTICS CHEMIST with 20 years experience in large and small companies desires challenging opportunity. Has Ph.D. in organic chemistry and wide experience in all technical functions, growth problems, patents, trouble shooting and organization. Has ability to work with management at all company levels. Background of experience has included positions as Chief Chemist and Director of Research. Address Box 344-P, RUBBER AGE.

CHEMICAL ENGINEER: 9 years of development, engineering and management, principally in molding and extruding. Plant and equipment design, product development, formulation. Graduate Ch. E., age 32. Address Box 345-P, RUBBER AGE.

PLANT MANAGER with over 30 years experience in all phases of rubber manufacturing operations desires to relocate, preferably in the East. Development engineering, compounding, milling, extruding, molding and calendering. Experienced with all types of rubber and Government specifications. Selection and maintenance of mechanical equipment including mold and die designing. Numerous excellent trade contacts. Address Box 349-P, RUBBER AGE.

PROGRESSIVE INDIVIDUAL now heading up technical service and product development department of company manufacturing plasticizers and other chemicals for the rubber, plastics and allied industries, seeks similar or related position preferably with company having international connections. Graduate chemist—17 years experience research, development, compounding, manufacturing, technical sales and service. Address Box 350-P, RUBBER AGE.

POSITIONS WANTED—Continued

MAN, widely experienced all phases commercial, public relations, exports, offers to cover your lagging territory or to assist your overburdened executives. Presently employed. Complete resume of experience and qualifications upon request. Personal interview preferred. Address Box 326-P, RUBBER AGE.

CHEMICAL TEAM—Ph.D. and B.S., 35 yars combined experience, imagination, strong adjunct forward programs, rubbers, plastics, coatings, additives. Address Box 346-P, RUBBER AGE.

MANAGER—SUPERVISOR. 25 years experience manufacturing rubber heels, soles, soling slabs, toplifting slabs; closed cell and open cell sponge rubber. Address Box 354-P, RUBBER AGE.

HELP WANTED

CHEMIST — CHEMICAL ENGINEERS
"Positions with the better firms"

An active, confidential service!
Interview at your convenience!

"Many Junior Positions"
Call, write, or wire:—GLADYS HUNTING (Consultant)

DRAKE PERSONNEL, INC.
7 W. Madison St., Chicago 2, Ill., FI 6-2107

PLASTISOL CHEMIST, experienced. Plant vicinity New York. Address Box 333-W, RUBBER AGE.

SILICONE TECHNICAL SALESMAN—for sales and product application of silicone in mechanical goods field. Past experience in silicone sales and production methods and facilities required. Address Box 336-W, RUBBER AGE.

RUBBER CHEMIST. Experienced Rubber Chemist for research involving all types of synthetic elastomers. Minimum of 3 years experience in rubber technology and rubber compounding. New laboratory in San Francisco Bay area. Division of large chemical company. Write giving full particulars regarding age, experience, education and salary expected. Replies held confidential. Address Box 338-W, RUBBER AGE.

PRODUCT ENGINEER
Eastern rubber manufacturer is expanding V-belt technical staff. Wish to employ additional young graduate engineers with V-belt experience. In reply please cite education, experience, references, and salary requirements. Address Box 341-W, RUBBER AGE.

RECLAIM DEVELOPMENT ENGINEER
Desire graduate engineer with three to six years experience in reclaim rubber process development. Knowledge of formulation and quipment needed. Production experience essential. Excellent working conditions and employee benefit program in Rocky Mountain region. Write Personnel Department.
GATES RUBBER COMPANY
Denver, Colorado

"Help Wanted" continued on next page

ROTEX SCRAP
BUYING AND SELLING

RUBBER
Uncured Stocks
Scorched Compounds
Cured Overflow
Graded to specification

PLASTICS
Vinyl — Polyethylene
Bought — Graded — Sold
Cuttings, trimmings, Overflow,
Slabs, Lumps, Discontinued Lots

SERVICES
Mill-Compounding
Extruding — Pelletizing
Cutting — Grinding
Separating, Coloring

ROTEX RUBBER COMPANY, INC., 1-23 JABEZ ST., NEWARK 5, N. J. • TEL. MARKET 4-4444

HELP WANTED—Continued

RUBBER PROCESS ENGINEER—experienced in compression and transfer molding of natural and synthetic rubber including silicones wanted by independent rubber company. Location Eastern seaboard. Address Box 355-W, RUBBER AGE.

RUBBER CHEMICALS DEVELOPMENT

Opportunities for chemists under 33 with several years experience in rubber emulsion polymerization or rubber compounding. Work will include development of elastomers and associated chemicals, and evaluation and formulation of latex emulsion paints. Position is essentially in research, but may lead to sales and technical service. Please write giving personal and work history to:

Employment Supervisor
Shell Development Company
Emeryville, California

LATEX CHEMIST

Required for Development Laboratory of compound supplier. Must have compounding experience in the use of natural and synthetic latices for dipped goods, casting, adhesives and foam applications. Excellent opportunity for graduate chemist or chemical engineer in a new plant in the midwest. Good starting salary.

Replies held in strict confidence.

Address Box 351-W, RUBBER AGE

Rubber technician or chemist with experience in the manufacture of compressed asbestos sheet packing. Excellent opportunity with well established company in this field. Location near Philadelphia. Please submit resume of qualifications, experience and salary expected. Your reply will be held confidential.

Address Box 340-W, RUBBER AGE

TECHNICAL WRITER

If you are now (or have been in the recent past) actively engaged in technical writing and have a background in rubber chemistry, you may be the man we need.

You should have had about three to five years plant experience, be about 30 years of age, and want to work in the New York City area for a progressive technical journal. You should have the ability to express your thoughts clearly, be able to interpret technical material and be able to meet and talk freely with people.

Your work will be editing and originating technical material. You will work in a relatively small organization devoted to a single field. Surroundings and working conditions are pleasant and future prospects are good.

Your reply will be held in absolute confidence. If you are interested, please write stating education, experience, salary desired. Send recent snapshot.

Address Box 343-W, RUBBER AGE

Exceptional Opportunity for

RUBBER CHEMISTS

having from two to five years' experience in the rubber industry and holding degrees in chemistry or chemical engineering. Development and sales service work with well established Eastern firm. Excellent laboratory facilities. Opportunity for contacts with customers, salesmen and production people.

Your reply will be held confidential. Please give age, experience and education.

Employees know of this ad.

Address Box 260-W, RUBBER AGE

HELP WANTED—Continued

MECHANICAL rubber goods plant in California requires young graduate chemist, with at least two years actual compounding experience in this line. Excellent opportunity with successful established company. Replies confidential. Address Box 356-W, RUBBER AGE.

Rubber Molding Manufacturer desires graduate chemist or chemical engineer. Experience desired but not essential. Excellent opportunity with a very old and successful company.

Write Personnel Department,
American Hard Rubber Co.,
Box 510, Akron 9, Ohio.

UNUSUAL OPPORTUNITY

WELL ESTABLISHED EASTERN FIRM HAS OPENINGS FOR TWO MEN:

Chemist for development work and to assist in production.

Salesman to handle sales and to assist in the development of new items.

The men we desire must be experienced in their own fields.

Give complete resume in first letter and salary expected.

All replies will be held in strict confidence.

Address Box 331-W,
RUBBER AGE

RUBBER TECHNOLOGIST—TECHNICAL SALES SERVICE

Large eastern chemical manufacturer has technical sales service opening in synthetic rubber and rubber chemicals. Age 25 to 35. Several years experience in rubber manufacture. College degree. Foreign languages, preferably German and French, very desirable but not essential. Should be willing to make headquarters in Europe. Excellent opportunity in rapidly expanding field. Write giving in full detail age, education and experience. Replies held strictly confidential. Our employees know of this ad.

Address Box 342-W, RUBBER AGE

SILICONE RUBBER, MOLDING

Small company in Yonkers, N. Y., requires man to take charge of production. Salary commensurate with ability, experience. Address Box 358-W, RUBBER AGE.

RUBBER COMPOUNDER

Nationally known rubber manufacturer has an excellent opportunity for a rubber compounder. Company desires an individual who is a chemist or a chemical engineer. Position would be in our company sales department. Please submit complete educational background, employment history and salary requirements. Address Box 352-W, RUBBER AGE.

RUBBER COMPOUNDER

New Jersey electrical wire and cable company desires rubber chemist experienced in natural and synthetic rubber compounding for its modern research laboratories. Address Box 359-W, RUBBER AGE.

Writing

RUBBER AGE?

After March 18, 1955, our new address will be: 101 W. 31st St., New York 1, N. Y.

New Phone: PEnna 6-6872

FINELY PULVERIZED, BRILLIANT
COLORS
FOR RUBBER-VINYLS

Western Representative: FRED L. BROOKE CO., P.O. Box 463, Oak Park, Ill.
Ohio Representative: PALMER SUPPLIES CO., 2281 Scranton Road, Cleveland 13; 800 Broadway, Cincinnati 2,
Pacific Coast: ERWIN GERHARD, 40 California St., San Francisco 11, Calif.

BROOKLYN COLOR WORKS INC.,
MORGAN & NORMAN AVES., BROOKLYN 22, N.Y.

THE NAME TO REMEMBER
FOR PRECISION
Mc NEIL
AKRON
Manufacturers of the World's
Finest Rubber Curing Equipment

KAUTSCHUK UND GUMMI

Official Journal of the German Society of Rubber Chemists and Technologists (Deutsche Kautschuk-Gesellschaft e.V.) the most quoted and authoritative German Rubber Journal.

KAUTSCHUK UND GUMMI promotes international exchange of ideas concerning economic, technical and scientific problems involved in the different phases of the manufacture of rubber and asbestos products. Business experts and authorities in science and technology supply facts, opinions and research results. Reports and information from the industry's various associations are included.

KAUTSCHUK UND GUMMI is an excellent advertising medium which speaks to just those firms in the import and export trade to whom you want to speak. Specimen copy and advertising rates on application to the publishers.

KAUTSCHUK UND GUMMI
Berlin - Borsigwalde • Frankfurt am Main

NATIONAL SHERARDIZING & MACHINE CO.
AIR BAG BUFFING MACHINERY
STOCK SHELLS HOSE POLES
MANDRELS
858 Windsor St., Hartford, Conn.
Representatives: Akron New York

Mold Lubricants

Silicones • Non-Silicones

We blend the mold lubricant to the job. Tell us your molding problems. We have a wide variety of standard lubricants from which to choose the one for your job.

Write today for technical data and price lists.

Stoner's Ink Company
Quarryville, Pa.

STEEL CALENDER STOCK SHELLS

ALL STEEL, ALL WELDED CONSTRUCTION, with forged steel hubs for 1¼", 1½" and 2" square bars. 4", 5", 6", 8", 10", 12", 15", 20" and 24" diameters. Any length.
Also Special Trucks (Leaf Type) Racks, Tables and Jigs, Used in manufacturing rubber and plastic products.

THE W. F. GAMMETER COMPANY
CADIZ, OHIO

Unique Colloidal Whiting
Economical Rubber
Re-inforcer
HAKUENKA
Special attention to Export Trade
SHIRAISHI KOGYO KAISHA, LTD.
Kitahama, Osaka, Japan

SINCE 1880 RUBBER GOODS
Rand. REG. U. S. PAT. OFF.
"They Last Longer" REG. U. S. PAT. OFF.
DRESS SHIELDS
DRESS SHIELD LININGS
BABY PANTS
BABY BIBS & APRONS
SANITARY WEAR
RUBBERIZED SHEETING
RUBBER APRONS
STOCKINET SHEETS
RUBBER SHEETS
RAINCAPES & COATS
RUBBER SPECIALTIES
VINYL PLASTIC SHEETING
RUBBER DAM & BANDAGES — SHEET GUM
RAND RUBBER CO. BROOKLYN, N. Y. U. S. A. MFRS.

FLEXO JOINTS

THE STANDARD FOR SAFETY

• Proved in years of efficient service, FLEXO JOINTS offer the flexibility of hose — the strength of pipe — the ideal steam connection for presses, tire molds, etc.
Four styles, for standard pipe sizes ¼" to 3".
• Write for information and prices.

FLEXO SUPPLY CO., INC., 4662 Page Blvd., St. Louis 13, Mo.
S. A. ARMSTRONG, LTD.
In Canada: 1400 O'Connor Dr., Toronto 13, Ont.

Directory of CONSULTANTS

R. R. OLIN LABORATORIES
Rubber Technologist—Development and research in Natural Rubber, Synthetic Rubber and Plastics. Also chemicals and compounding materials used with these materials.
P.O. Box 372 RA, Akron 9, Ohio

SOUTH FLORIDA TEST SERVICE
(Established 1931)
Corrosion, weathering and sunlight tests. Four locations in Southern Florida for inland, salt atmospheric, tidewater and total immersion exposure tests.
4201 N. W. 7th St., Miami, Florida

PHILIP TUCKER GIDLEY
Consulting Technologist—Research, product development, formulas, factory plans, engineering, chemical and physical testing.
Fairhaven, Massachusetts

HALE AND KULLGREN, INC.
Specialists in Process and Plants for Rubber and Plastics
A Complete Engineering Service: including: Economic Surveys; Process Design; Installation; Contracting and Operation.
613 E. Tallmadge Ave., Akron 10, Ohio

HOWE MACHINERY CO., INC.
30 Gregory Avenue, Passaic, N. J.
DESIGNERS & BUILDERS
OF "V" BELT MANUFACTURING EQUIPMENT
Cord Latexing, expanding mandrels, automatic cutting, skiving, flipping and roll drive wrapping machines
ENGINEERING FACILITIES FOR SPECIAL EQUIPMENT
Call or Write

Granulated Cork
PROCESSED TO SPECIFICATION
MARYLAND CORK COMPANY, INC.
414 Baltimore Life Bldg. Charles & Saratoga Sts.
Baltimore 1, Maryland

Volume IX
THE CHEMICAL FORMULARY
Editor-in-Chief, H. BENNETT
648 Pages • 5½ x 8½ • $7.50

This new volume is a collection of up-to-date formulae compiled by the country's leading industrial and research chemists. An entirely new book, complete in every detail, each formulae is new and different. All of the formulae are the result of long years of research and experiments.

No important industry has been overlooked. No matter how simple or complex a problem may be, this book will enable the solving of it easily and quickly. The chapter on rubber, resins, plastics and waxes contains many new and helpful formulae, many of which have never before been revealed. Get your copy today.

Order from
THE RUBBER AGE
250 West 57th Street New York 19, N. Y.

softeners and plasticizers for rubber from the pine tree
ROSIN OIL • PINE TAR
BURGUNDY PITCH
GALEX a non-oxidizing RESIN
Send for "Pine Tree Products" Booklet
NATIONAL ROSIN OIL PRODUCTS, Inc.
Americas Bldg. Rockefeller Center, 1270 Ave. of the Americas, New York 20
Refinery: Savannah, Ga. Branches in Principal Cities
PIONEERS OF THE INDUSTRY

BUSINESS OPPORTUNITIES

CUSTOM MIXING, GRINDING and DISPERSION. Production time available on Rotary Cutters, Colloid Mills and explosion-proof Churns with attached filtering mediums. At your service—the technical know-how and completely equipped control laboratory. ADHESIVES & COATING SPECIALTIES, INC., Bldg. #22, 410 Frelinghuysen Ave., Newark 5, N. J.

RUBBER MOLDS
I will invest up to $5,000 in rubber molds for the manufacture of any item which will stand careful scrutiny. GEORGE B. FARWELL, 1045 Sonoma Ave., Menlo Park, Calif.

CUSTOM DIPPING
We have open time on our latex dipping machines. Send drawings or samples and specifications for estimates on your requirements to BLAKE, Box 152, West Hanover, Mass.

MANUFACTURERS REPRESENTATIVES WANTED
Established manufacturer industrial processing cooling equipment desires representation. Indiana, Illinois, Wisconsin, Michigan, Minnesota, Louisiana. Exclusive territory. Liberal commission. Leads furnished. Representatives should have working knowledge of manufacturing industries in territory, particularly rubber, plastics, chemical. Successful record of selling quality products to industrial management (price range $5,000.00 to $20,000.00) essential.
All replies will be given prompt, confidential consideration.
Address Box 335-B, RUBBER AGE

DISTRICT SALES ENGINEERING REPRESENTATIVE
(Chicago Area)
Want established sales engineer to represent company manufacturing plastic coating machinery and related equipment for fabrics, paper and continuous materials. Must be either chemical or mechanical engineering graduate, or equivalent, with working knowledge of continuous process machinery. Protected territory, ample home office assistance and support. Reply strictly confidential. Address Box 357-B, RUBBER AGE.

BLACK
Master Batching
Mixing of all kinds
BESTREAD PRODUCTS CO. **STOUGHTON, MASS.**

MIXING
To Your Specification
K. B. C. INDUSTRIES, INC. **NEW HAVEN, CONN.**
881 State St. Tel: State 7-5662
Otto J. Lang, General Manager

Custom Mixing RUBBER-PLASTICS
We do milling and compounding of all types—black or color—master batches
All mixing done under careful supervision and laboratory control.
Phone: Butler 9-0400

Pequanoc Rubber Co.
MANUFACTURERS OF RECLAIMED RUBBER
MAIN SALES OFFICE and FACTORY, BUTLER, N. J.

EQUIPMENT WANTED

WANTED: Rubber machinery including Banbury mixers, heavy duty mixers, calenders, rubber rolls and mixers, extruders, grinders and cutters, hydraulic equipment, rotary and vacuum shelf dryers, injection molding machines. Will consider now operating or shut down plant. P. O. Box 1351, Church Street Station, New York 8, N. Y.

WANTED: Rubber mills, calenders, mixers, Banbury mixers, extruders, grinders, cutters, hydraulic presses, injection molding machines. Consolidated Products Co. Inc., 70 Bloomfield St., Hoboken, N. J.

WANTED: 50″ or 60″ used heavy duty mill, complete; also #1 or 2 Tuber, good condition. Address Box 353-E, RUBBER AGE.

WANTED: One used 72″ x 14 ft. vulcanizer, 100 psi quick opening door. Give price F.O.B. Union Grove, Wisconsin. Equipment must be in first class condition.

WISCONSIN RUBBER PRODUCTS CO., INC.
Attention Donald J. Rasor, Pres.
Post Office Box 454
Union Grove, Wisconsin

WANTED: Baker-Perkins type mixer, 500-2000 gallons capacity. Must be sigma blades. Address Box 347-E, RUBBER AGE.

WANTED: Used double opening hydraulic press. 20 to 30 feet long. 40 to 50 inches wide. Mr. S. M. Cossey, PALM, FECHTELER COMPANY, 85 Maple Street, Weehawken, N. J.

EQUIPMENT FOR SALE

SAVE WITH GUARANTEED REBUILT EQUIPMENT: 2 New R. D. Wood 500 ton embossing presses; 54″ x 26″ platen, HYDRAULIC PRESSES; 40″ x 54″, 36″ ram, 1500 tons; 30″ x 26″, 16″ ram, 600 tons; 2—27″ x 27″, 18″ rams, 585 tons; 20″ x 20″, 10″ ram, 200 tons; 20″ x 20″, 14″ ram, 200 tons; 15″ x 15″, 8″ ram, 75 tons; 14″ x 14″, 8″ ram, 75 tons; 2—19″ x 24″, 10″ rams, 78 tons; 18″ x 18″, 7″ ram, 50 tons; 10—26″ x 26″, 7″ rams, 50 tons; 12″ x 12″, 7½″ ram, 50 tons; 14″ x 14″, 8″ ram, 50 tons; 8″ x 9½″, 4½″ rams, 20 tons; 16″ x 16″, 3½″ rams, 12 tons; Carver model 150 and 6″ x 6″ LABORATORY PRESSES; Stokes Model T, late type with drive; Stokes Model T, late type with hydraulic equalizer system and drive; Colton 5½T with drive PREFORM PRESSES; NEW UNIVERSAL DUAL PUMPING UNITS, 3-15 HP; NEW LABORATORY MILLS and CALENDERS; HPM 6″ ram, 2500# pressure ACCUMULATOR; also Extruders, Mixers, Vulcanizers, Injection Molding Units, etc. UNIVERSAL HYDRAULIC MACHINERY COMPANY, INC., 285 Hudson Street, New York 13, N. Y.

FOR SALE—90 KVA Capacitor, 2,300 to 240 Volt—2 Ph. National Electric Condenser Co. COOKE COLOR & CHEMICAL CO., Hackettstown, New Jersey.

EXTRUDER 4″ ALLEN, First Class Condition.
No motor. Rebuilt for own use. Will sell, reasonable. Specifications available. Private owner. DAN DRENNAN, 12845 Dunrobin Ave., Downey, California.

FOR SALE: 1—Farrel-Birmingham 6″ x 13″ 3-roll calender; 1—Royle #4 extruder, motor driven; 1—Farrel-Birmingham 32″ x 92″ inverted-L, 4-roll calender, reduction drive, D.C. varispeed motor; 4—Hymac 150 ton molding presses, 16″ x 16″ electrically heated platens; 1—6″ x 12″ laboratory mill, m.d.; 1—Ball & Jewell rotary cutter, Model 251, m.d.; 2—Baker-Perkins size 15, 100-gallon jacketed mixers; 5—horizontal dry powder ribbon mixers, 4000#, 1500#, 500#; 1—new 3-roll 6″ x 16″ laboratory calender, m.d.; 1—Farrel-Birmingham 60″ mill with reduction drive, 150 HP motor, floor level mounting; 1—Fitzpatrick "D" comminutor, s.s. contact parts jacketed; 1—Mikro-Pulverizer #2TH, with motor; 4—Reed-Prentice & WS injection molding machines, two 16 oz.; also other sizes Hydraulic Presses, Tubers, Banbury Mixers, Mills, Vulcanizers, Calenders, Pellet Presses, Cutters. WANTED: Your Surplus Rubber Machinery. CONSOLIDATED PRODUCTS COMPANY, INC., 70 Bloomfield St., Hoboken, N. J. HOboken 3-4425; N. Y. Phone: BArclay 7-0600.

COMPLETE PLASTIC BUTTON MOLDING PLANT: 1—Stokes 200 ton model 250-A semi-automatic press, 2—Stokes 150 ton model 250-A semi-automatic presses, 3—Stokes RDS-3 rotary tablet machines, 3—MKO 2 HP, 150 PSI gas boilers, 3—Buttondex broachers, definners, inspection conveyors, tumbling barrels, 18, 22, 24, 30 Ring Fisheye, poker chip and electric plug molds, etc. Other Hydraulic Presses: Erie 4000 ton and Baldwin-Southwark 3600 ton belt presses. Birdsboro 2000 ton, Farrel 1000 ton, HPM 750 ton, Erie 700 ton, Baldwin-Southwark 400 ton, Farrel 393 ton and 200 ton, Watson-Stillman 110 ton and 100 ton, HPM 100 ton and 35 ton molding presses and Watson-Stillman 30 ton lab presses. INJECTION MOLDING MACHINES: various makes, 2 oz. to 22 oz. EXTRUDERS: No. 1 Royle and larger. MISCELLANEOUS: Lab mixers and mills, MPM pelletizer, rotary cutters, etc.

JOHNSON MACHINERY COMPANY
683-R Frelinghuysen Avenue — Newark 5, New Jersey
BIgelow 8-2500
WHAT HAVE YOU FOR SALE? **WHAT ARE YOU LOOKING FOR?**

"Equipment for Sale" continued on next page

New Parts
FOR NO. 3 and 5
ROYLE EXTRUDERS
Consisting of
BEARINGS, GEARS, SCREWS, STRAINER PLATES, ETC.
BOX 1106
1474 BROADWAY, NEW YORK CITY

2—18″ x 50″ Farrel Mills with motor and drive
1—Farrel Refiner—20″ x 30″
1—Farrel Cracker—20″ x 36″
1—9″ x 20″ Farrel 2-Roll Calender with motor and drive
2—1000 Ton Hydraulic presses—28″ ram
1—380 Ton Hydraulic press—18″ ram
2—300 Ton Hydraulic presses—16″ ram
Mills from Laboratory size to 50″ in stock.
Presses from 75 ton to 1000 ton in stock.
We specialize in rebuilding rubber and plastics machinery.
All of our rebuilt machinery is guaranteed.
Reliable
RUBBER & PLASTIC MACHINERY CO., INC.
2014 UNION TURNPIKE NORTH BERGEN, N. J.
PHONE: UNION 5-1073

START A REFERENCE LIBRARY
Of Your Own
With Your Subscription
To RUBBER AGE
. . . "The Continuing Adult Education of the Rubber Industry."
Rates are
$5.00 for 1 year in the U.S.
$5.50 in Canada
$6.00 — Foreign

Please enter my subscription to RUBBER AGE for one year starting with the next issue.
☐ **Check enclosed** ☐ **Bill me**
Name _____
Title _____
Company _____
Street _____
City and State _____
Please check whether address is:
☐ **Company or** ☐ **Home**

EQUIPMENT FOR SALE—Continued

FOR SALE—50 HP—12 x 10 Sullivan Air Compressor Motor and Controls—$1,200. IMPERIAL RUBBER MFG. CO., Hackettstown, New Jersey.

FOR SALE: 2—28" x 30" hydraulic presses, 20" ram; 1—8" x 16" 3-roll laboratory calender; 1—16" x 40" rubber mill MD; 1—4' x 12' vulcanizer, O.O. door; also extruders, mixers, cutters, etc. CHEMICAL & PROCESS MACHINERY CORP., 146 Grand Street, New York 13, N. Y.

Hydraulic presses and pumps rebuilt, repaired. New presses from laboratory up to 1000 tons. Pumping units up to 10,000 p.s.i., all capacities. CLIFTON HYDRAULIC PRESS CO., 290 Alwood Rd., Clifton, New Jersey.

THE AKRON RUBBER MACHINERY CO. INC.
"ARMACO"
New Rubber & Plastics Machinery
ALSO
A complete stock of used reconditioned guaranteed machinery for rubber & plastic.
Phone HE 4-9141 **P. O. Box 88 Akron 9, Ohio**

Phoning

RUBBER AGE?

After March 18, 1955, the new phone will be: PEnna 6-6872

New Address: 101 W. 31st St., N.Y. 1, N.Y.

USED MACHINERY
FOR SALE

1—Baldwin 5' x 6' horizontal Vulcanizer, quick opening door, ASME 150 psi.
1—National Rubber Machinery Company—2½" Plastic Extruder, jacketed for hot oil.
1—Welding Engrs. 4" Stainless Steel Double Screw Rubber Extruder w/15 HP Explosion Proof motor.
1—Welding Engrs. 2" Stainless Steel double Screw Rubber Extruder w/3 HP motor.
1—Calender Mill 2 roll 12" x 24"w/motor drive.

We are interested in purchasing individual items and complete plants.

R.GELB & SONS Inc.
STATE HIGHWAY No.22, UNION, N.J.
MURDOCK-6-4900

GUARANTEED
REBUILT MACHINERY
MILLS, CALENDERS, TUBERS, VULCANIZERS, PUMPS, ACCUMULATORS, MIXERS, PULVERIZERS, HYDRAULIC PRESSES, CUTTING MACHINES
Immediate Deliveries from Stock

UNITED RUBBER MACHINERY EXCHANGE
183-189 ORATON STREET
NEWARK 4, N. J.
CABLE: "URME"

TESTED IS TRUSTED
MODEL X Tensile Tester
One of the many *Scott Testers for "World-Standard" testing of rubber, textiles, plastics, paper, wire, plywood, up to 1 ton tensile.

SCOTT TESTERS
*Trademark
SCOTT TESTERS, INC.
85 Blackstone St. Providence, R. I.

The French Rubber Journal
REVUE GENERALE DU CAOUTCHOUC
42, rue Scheffer. Paris 16. France
Monthly Magazine established in 1924

Deals with all that concerns rubber. Up to date on every problem of the day. Also monthly French and Foreign rubber bibliography.

Subscription rate: 2700 Francs a year
Price per copy: 300 Francs

Free sample copy on request

WILLIAM TAPPER
USED RUBBER WORKING MACHINERY
20" x 60" Mill • 4FB Refiners, 21x24x36", Tilting Type
Cash for your surplus equipment
Wanted: 84" Mill • 3A Banbury • No. 9 Banbury
30 South Broadway, Yonkers, N. Y.
PHONE: YONKERS 3-7455
CABLE: WILTAPPER YONKERS, N. Y.

NEW and REBUILT MACHINERY
SINCE 1891
L. ALBERT & SON
Trenton, N. J. **Akron, O.** **Chicago, Ill.** **Los Angeles, Calif.**

INDEX TO ADVERTISERS

Accurate Steel Rule Die Manufacturers 955
Adamson United Co. 865
Advance Solvents & Chemical Corp. ..... —
Aetna-Standard Engineering Co. ..... —
Akron Equipment Co. ..... —
Akron Rubber Machinery Co. 962
Albert, L., & Son 962
Alco Oil & Chemical Corp. 870
American Cyanamid Co.
Intermediate & Rubber Chemicals Dept. 817
Pigments Div. ..... —
American Enka Corp. ..... —
American Maintenance Supply Corp. 844
American Resinous Chemicals Corp. 934
American Zinc Sales Co. 831
Ames, B. C. Co. 942
Argus Chemical Corp. ..... —
Atlas Electric Devices Co. 846
Audit Bureau of Circulations 838

Bell Clay Co. ..... —
Bestread Products Co. 960
Binney & Smith Inc. ..... Insert Following 906
Black Rock Manufacturing Co. ..... —
Bolling, Stewart, & Co., Inc. 836
Bonwit, Eric ..... —
Bridgwater Machine Co. 835
Brockton Cutting Die & Machine Co. ..... —
Brookfield Engineering Labs, Inc. ..... —
Brooklyn Color Works, Inc. 959
Brown Co. ..... —

Cabot, Godfrey L., Inc. 819, 855
Calcium Products Div. 820
Cambridge Instrument Co., Inc. ..... —
Carey, Philip, Manufacturing Co. ..... —
Carter Bell Manufacturing Co. 930
Cary Chemicals, Inc. ..... —
Century Products Co. 941
Chemical Publishing Co., Inc. 960
CLASSIFIED ADVERTISING 957-62
Cleveland Liner & Manufacturing Co. 830
Clifton Hydraulic Press Co. 941, 962
Colledge, E. W., General Sales Agent, Inc. ..... —
Columbia-Southern Chemical Corp. 815
Columbian Carbon Co. ..... Insert Following 906
Concord Mica Corp. ..... —
Consolidated Products Co. 961
CONSULTANTS SECTION 960
Continental Carbon Co. ..... Insert Following 856
Continental Machinery Co., Inc. 842
Cooke Color & Chemical Co. ..... —
Coultar, James, Machine Co. 862
Cumberland Engineering Co., Inc. ..... —

D. P. R. Inc. 943
Darlington Chemicals, Inc. 942
Davis-Standard Sales Corp. ..... —
Dayton Rubber Co. 947
Diamond Alkali Co., Pure Calcium Prod. Div ..... —
Dow Corning Corp. 869
Drake Personnel, Inc. 957
Du Bois Co., Inc. 936
du Pont de Nemours, E. I., & Co., Inc.
Elastomers Div. ..... Second Cover, 845
Durez Plastics & Chemicals, Inc. ..... —

Emery Industries, Inc. ..... —
English Mica Co. ..... —
Erie Engine & Manufacturing Co. 868
Erie Foundry Co. 818

Falls Engineering & Machine Co. 945
Farrel-Birmingham Co., Inc. 813, 841
Ferry Machine Co. 955
Fidelity Machine Co., Inc. ..... —
Flexo Supply Co., Inc. 959
Flightex Fabrics, Inc. ..... —
French Oil Mill Machinery Co. 932

Gammeter, W. F., Co. 959
Gelb, R., & Sons, Inc. 962
General Aniline & Film Corp. 853
General Latex & Chemical Corp. 951
General Magnesite & Magnesia Co. 935
General Tire & Rubber Co. 843
Genseke Brothers 863
Georgia Marble Co. 820
Gidley, Philip Tucker 960
Giffels & Vallet, Inc. ..... —
Glidden Co.
Chemicals-Pigments Metals Div. 827
Goodman, G. F., & Son ..... —
Goodrich, B. F., Chemical Co. 805
Goodyear Tire & Rubber Co.
Chemical Div. 808, 809
Gross, A., & Co. ..... —
Gummi und Asbest ..... —
Gussett Boiler & Welding, Inc. 823

Hale & Kullgren, Inc. 960
Hall, C. P., Co. 834
Harchem Div. 850
Harshaw Chemical Co. 837
Harwick Standard Chemical Co. ..... Back Cover
Heinemann Saw Mfg. Co. 945
Hercules Powder Co., Inc. 828
Heavetex Corp. 945
Hoggson & Pettis Manufacturing Co. 864
Holliston Mills, Inc. ..... —
Holmes, Stanley H., Co. ..... —
Howe Machinery Co., Inc. 960
Huber, J. M., Corp. 872
Humko Corp., Trendex Div. ..... —

Independent Die & Supply Co. ..... —
Indoil Chemical Co. ..... Inside Back Cover
Industrial Ovens, Inc. 832
Industrial Research Laboratories 953
Injection Molders Supply Co. ..... —
Institution of the Rubber Industry 940

Johnson Corp. 939
Johnson Steel & Wire Co., Inc. 866, 867
Johnson Machinery Co. 961

Kautschuk und Gummi 959
K. B. C. Industries, Inc. 960
Kenrich Corp. 859
Koppers Co., Inc. 864

La Goma ..... —
Lambert, E. P., Co. 947
Lehmann, J. M., Co., William R. Thropp & Sons Div. 810
Liquid Carbonic Corp. ..... —
Littlejohn & Co., Inc. 953

Marbon Corp. 811
Marine Magnesium Products, Division of Merck & Co., Inc. ..... —
Maryland Cork Co., Inc. 960
McNeil Machine & Engineering Co. 959
Mevercord Co. 938
Miller, F. P. & Son, Inc. ..... —
Molded Fiberglass Tray Co. 937
Monsanto Chemical Co.
Organic Div. ..... —
Plastics Div. ..... —
Mt. Hope Machinery Co. ..... —
Mt. Vernon-Woodberry Mills, Inc. ..... —
Muehlstein, H., & Co., Inc. 927

National Chemical & Plastics Co. ..... —
National Forge & Ordnance Co. 942
National Rosin Oil Products, Inc. 960
National Rubber Machinery Co. 861
National Sherardizing & Machine Co. 959
National-Standard Co. ..... —
Naugatuck Chemical Division
U. S. Rubber Co. 825, 874
Neville Chemical Co. 847
New Jersey Zinc Co. 814

Oakes, E. T., Corp. 816
Ohio-Apex Division
Food Machinery and Chemical Corp. ..... —
Olin Mathieson Chemical Corp. ..... —
Olin, R. R., Laboratories 960
Oronite Chemical Co. ..... —

Pan American Chemicals ..... —
Parsons-Plymouth, M. W., Inc. ..... —
Pasadena Hydraulics, Inc. 953
Paterson Parchment Paper Co. 868
Pennsylvania Industrial Chemical Corp. ..... —
Pequanoc Rubber Co. 960
Phillips Chemical Co. ..... 806, Insert Following 838
Pittsburgh Steel Co. 866, 867
Pluess-Staufer (North American) Inc. ..... —
Polymel Corp. 854
Progressive Service Co. 937
Pure Carbonic Co. 824

Rand Rubber Co. 959
Randall, Frank E., Co., Inc. 939
Rare Metal Products Co. ..... —
Reliable Rubber & Plastic Machinery Co. 961
Revue Générale de Caoutchouc 962
Rhodia, Inc. ..... —
Richardson, Sid, Carbon Co. 964
Rotex Rubber Co., Inc. 957
Royle, John, & Sons 935
Rubber Corp. of America 937
Rubber Age Books 856, 955
Rubber Age Circulation 961
Rubber Age Moving 925
Rubber Red Book 848, 849

St. Joseph Lead Co. 812
Scott Testers, Inc. 962
Sharples Chemicals Inc. ..... —
Shaw, Francis, & Co., Ltd. 807
Shell Oil Co., Inc. ..... —
Shiraishi Kogyo Kaisha, Ltd. 959
Siempelkamp, G., & Co. ..... —
Simplex Cloth Cutting Machine Co., Inc. ..... —
Sinclair-Collins Valve Co. ..... —
Skelly Oil Co. ..... —
Skinner Engine Co. 851
Snell, Foster D., Inc. 953
South Florida Test Service 960
South Texas Tire Test Fleet 951
Southeastern Clay Co. ..... —
Southern Clays, Inc. 852
Spadone Machine Co. ..... —
Stamford Rubber Supply Co. 951
Stanley Electric Tool Div. 947
Stauffer Chemical Co., Inc. 833
Stoner's Ink Co. 959
Sun Oil Co. 929

Tanney-Costello, Inc. ..... —
Tapper, William 962
Taylor Instrument Companies ..... —
Taylor-Stiles & Co. ..... —
Textile Proofers Inc. 931
Thiokol Chemical Corp. 933
Thomaston Mills 935
Thropp, William R., & Sons, Div. J. M. Lehmann Co. 810
Titanium Pigment Corp. ..... —
Tracerlab, Inc. ..... —
Trade News Service ..... —
Treasury Dept. 860
Trendex Div., Humko Corp. ..... —
Turner Halsey Co. ..... —

United Carbon Co., Inc. ..... Insert Following 820
United Clay Mines Corp. 943
United Engineering & Foundry Co. 871
United Rubber Machinery Exchange 962
U. S. Rubber Co.
Naugatuck Chemical Div. 825, 874
Universal Hydraulic Machinery Co. 961
Universal Oil Products Co. ..... —
Utility Manufacturing Co. 938

Vanderbilt, R. T., Co. ..... Front Cover
Velsicol Corp. ..... —

Wallace & Tiernan, Inc. 850
Watson Standard Co. 862
Wellington Sears Co. 826
Western Supplies Co. ..... —
White, J. J., Products Co. 870
Whittaker, Clark & Daniels, Inc. ..... —
Williams, C. K., & Co., Inc. ..... —
Witco Chemical Co. ..... Insert Following 856
Woloch, George, Co., Inc. ..... —
Wood, R. D. Co. 829
Wyandotte Chemicals Corp. ..... —

HUGHES PRINTING CO.
EAST STROUDSBURG, PA.

... setting the pace

The pace is being set by the Sid Richardson Carbon Co. Through production of **TEXAS 109,** the super abrasion channel black which gives the compounder these plus features:

FAST CURE—Ph 9 plus

ULTIMATE TENSILE —Superior to channel black in both natural and GR-S

ELONGATION —Superior to channel black in both natural and GR-S

CRACKING —Equivalent to HAF in GR-S

ABRASION —Equivalent to ISAF in LTP and GR-S

... All this at HAF prices ...

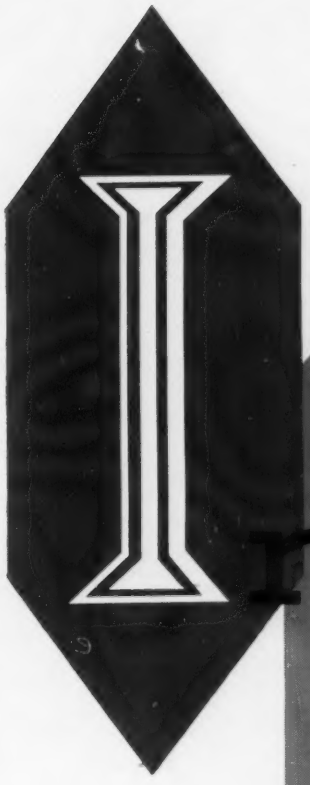
TEXAS CHANNEL BLACKS ®

Write, wire or telephone for samples and information

Sid Richardson CARBON CO.

FORT WORTH, TEXAS

GENERAL SALES OFFICES
EVANS SAVINGS AND LOAN BUILDING
AKRON 8, OHIO



Indonex

plasticizers

in
GR-S Extruded Bumper Compounds

Impart good processing and extrusion characteristics—minimize temperature build-up and deterioration under repeated impact.

Send for INDONEX Plasticizers Circulars 13-51.

INDOIL®
CHEMICAL PRODUCTS

INDOIL CHEMICAL COMPANY 910 South Michigan Avenue, Chicago 80, Illinois

FOR PLASTISOLS

that give "PLUS" QUALITIES

in Color Appeal and Service Life without a "Cost Premium"

STABELAN HR-50...

This fluid paste stabilizer, specifically developed for Plastisol formulations, contains plasticizer in addition to cadmium and barium with synergized chelating agent. It is suggested for those desiring a single stabilizer that can be readily stirred into Plastisol formulations with minimum mixing and maximum dispersion . . .

Other **STABELANS** also available —

STABELAN E — Paste — For excellent heat and light stability, and long outdoor aging.

STABELAN HR — Paste — A "single package" stabilizer containing cadmium and barium components with synergized chelating agent.

STABELAN HR — Liquid — A synergized chelating agent.

STABELAN HR — Powder — Metal-bearing component of STABELAN HR Paste.

*STANTONE PC Colors...

Pigments flushed or dispersed in a plasticizer to produce a uniform easy working smooth paste. Extra fineness of pigment particle is developed to assure maximum tinting strength . . . Available in a complete line of colors — yellow, orange, red, blue, green, black and white, developed specifically for easy mixing in Plastisol formulations.

*POLYCIZERS (Plasticizers)

— For Every Compounding Requirement:

POLYCIZER DCP— (Dicapryl Phthalate)
POLYCIZER DBS— (Dibutyl Sebacate)
POLYCIZER DBP— (Dibutyl Phthalate)
POLYCIZER 162— (Dioctyl Phthalate)
POLYCIZER 332— (Dioctyl Adipate)
POLYCIZER 532— (Octyl Decyl Adipate)
POLYCIZER 562— (Octyl Decyl Phthalate)
POLYCIZER 632— (Didecyl Adipate)
POLYCIZER 662— (Didecyl Phthalate)
*CULLUFLEX 179C— (Tricresyl Phosphate)
*CELLUFLEX 112— (Diphenyl Cresyl Phosphate)

* Registered U. S. Patent Office

STABELANS are manufactured by Stabelan Chemical Company

Products Courtesy of Steere Enterprises, Inc. Akron, Ohio

Write your nearest office for complete data

HARWICK STANDARD CHEMICAL CO.

60 South Seiberling Street, Akron 5, Ohio

Boston 16, Mass. 661 Boylston Street
Trenton 9, New Jersey 2595 E. State Street
Chicago 25, Illinois 2724 W. Lawrence Ave.
Los Angeles 21, Calif. 1248 Wholesale Street

39th Year

AUDITED PAID CIRCULATION ABC

APRIL, 1955

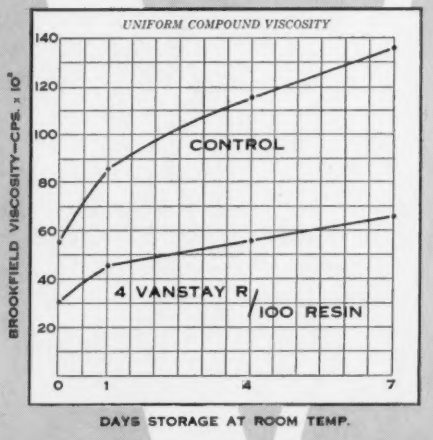
RUBBER AGE

now available

VANSTAY R

new liquid Heat Stabilizer for Vinyl

PLASTISOLS • ORGANOSOLS
SLUSH MOLDING COMPOUNDS



The essential properties of compound uniformity, crystal clarity, minimum heat discoloration and good aging are obtained by formulating with VANSTAY R.

Consult Vanderbilt Technical Service for advice or assistance in using VANSTAY Heat and Light Stabilizers to your advantage.

R. T. VANDERBILT CO., INC.

230 PARK AVE., NEW YORK 17, N.Y.

developed for

MAXIMUM CLARITY • MINIMUM HEAT DISCOLORATION